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THE CELL—1946

By C. W. MAYNARD, M.D.
Pueblo, Colorado

We are told that Laocoon, the priest of Apollo, incurred the enmity of Athena, and perished in the coils of two serpents summoned from the sea by the goddess. A famous scientific paper is spoken of by Needham as "revealing indeed a very Laocoon striving to dominate the coils of terminology." The expression must describe well many a worker in science who tries to follow the reports of progress in fields of knowledge not particularly his own. For example, a writer recently described an enzyme as a "proteinoid biological catalyst," which is, no doubt, an accurate definition. Another identifies enzymes as catalysts elaborated by cells, having colloidal qualities, and controlling the various processes associated with living organisms. This isn't too difficult, but still assumes a good deal of associated information.

There may be a certain amount of lese majesty involved in trying to outline some of the story of the cell in simple words. This attempt to do just that is far removed from the tremendous efforts of the masters in cytological research. Chemists, physicists, bacteriologists and their like do the work. It remains for a clinical pathologist to try to tell in his language a few ideas of cytology which others have elaborated.

The biological cell is no longer the unit of our knowledge of living matter. Not so long ago it was. Against a background of atomic and subatomic units the cell has become a complex structure with a bewildering architecture.

Needham lists the levels of organization as: 1. subatomic; 2, atomic; 3, the molecule; 4, the colloidal particle; 5, *the living nucleus and cell;* 6, the organ and organism; 7, the psychological and social entity. This puts cytology rather on the gross side of the scale.

Three items I have in mind: first, the chemical structure of the cell; second, an idea of how cell walls are penetrated; and third, some details demonstrated in the bacterial cell.

Bensley and his distinguished pupils and co-workers have demonstrated cell structure in a fashion which makes their

ideas useable in every-day thinking. They have succeeded in dissolving out, with appropriate solvents, one after another of the particulate portions of the cell, studying each group chemically. Finally, with only a structural shell left, they have dissolved the shell. Rebuilding the cell ideally they have pictured the cytoplasm as a mixture of mitochondria, which in mass are yellow in color, and which individually are several micra in diameter; balls of fat-protein complex, cherry-red in mass, and only 0.06 to 0.2 micron in size; spheres of glycogen particles, white in mass; and small threadlike micelles.

Mitochondria can be seen with the ordinary microscope, the lipoprotein particles and the bits of glycogen with the ultramicroscope. The threadlike structures are presumed to be important in keeping the cell structure intact, perhaps in the changing colloidal conditions of the cytoplasm.

The space between these formed particles is filled with proteins, carbohydrates and salts in solution.

The ultracentrifuge produces a force 200,000 to 400,000 times that of gravity, and can sediment the heavier parts of living cells much as the ordinary centrifuge separates red blood cells from plasma. In the cytoplasm this force drives the mitochondria outward, indicating that they are heavier than the rest of the cell protoplasm. The nucleus of the cell, which may have a controlling influence over the cytoplasm, is made up of: 1, nucleoli; 2, chromatin; 3, reticulum; 4, nuclear sap. In the nucleus the nucleoli are thrown outward most readily, and the chromatin next. It may be significant that in hyperplastic or rapidly growing cells, the nucleoli and the basophilic chromatin of the nucleus are separated by the ultracentrifuge more readily than in normal cells. Furthermore, in malignant cells "the displacement is easiest and greatest," according to Cowdry.

The distribution of minerals in cells is determined with considerable accuracy in two ways, by microincineration, and by the use of the emission type of electron microscope. By reducing thin layers of properly prepared cells to ash the total inorganic salt distribution is well shown. The electron microscope shows in addition that calcium and magnesium are concentrated particularly in the nucleus, in the cell membrane, and in certain portions of the striated muscle. Calcium is probably a factor in the determination of membrane permeability, and magnesium is known to be used in the release of energy in skeletal muscle.

Cells, in order to live and to reproduce, must receive a supply of food and be able to free themselves of metabolic waste. And the highly specialized cells, such as epithelium, nerve and muscle, must receive the chemicals used in their constructive activities.

Two of the mechanisms considered available for the permeation of cell membranes by chemicals in solution are, 1, lipoid

solubility, or the ability to be dissolved in fatlike molecules, and 2, pores. There is much evidence that in ordinary membranes an assortment of graded pore diameters is present. Molecules, from the minute HOH of water to much larger units, are able to pass through the pores, but not always freely. For example, some cells retain potassium salts and reject sodium, while others allow sodium in the cytoplasm but refuse to admit potassium. This is evidence of specific electrical activity.

(An interesting suggestion is made that some narcotics adhere to the pore walls, and reduce cell activity by slowing mechanically the free passage of needed substances.)

The size of the molecule is no bar to its passage through a cell wall if the substance is soluble in the fatty portion of the membrane. One schematic structure proposed as that of the plasma membrane shows, 1, an outer layer of protein molecules; 2, lipoids anchored to the protein by atomic groups which are water soluble; 3, a layer of unorganized fatlike material; 4, lipoid molecules anchored to; 5, an inner protein layer.

Another scheme suggests a mosaic of fatty and protein molecules.

Whatever the actual structure, the large penetrating molecules must occupy space as they are dissolved and pass through the fatty layer, and a certain degree of elasticity must be present to allow the permeability by solution.

We have all waited impatiently for a deliberate chemical reaction to be completed in flask or beaker. The contrast of the speed with which chemical reactions may occur in the body is typified by the statement that an enzyme molecule may react several thousand times a minute (Hoeber, P. 391). This rapidity of reaction maintains cell life and makes its metabolic activity possible.

Needham presents an application of enzyme action in the development of the embryo, and as a possibility in the production of malignant cells. He proposes that the various tissues of the maturing embryo are called forth by an enzyme which he calls an "organizer." This "organizer" is related chemically to the sterols, of which cholesterol is the one we know best. The organizer meets cells which contain molecules ready to produce nerve, skin, bone or other specialized structures, and the appropriate growth takes place. This idea is easily transferred to the meeting of an enzyme with a cell slightly abnormal in chemical condition, or to a slight variation in the enzyme itself. The result then could be an abnormal cell, even the sort which is termed malignant. Since it happens that some of the sex hormones, as well as materials used to produce experimental malignancy, are similar in chemical structures to Needham's "organizer" enzyme, the idea may be a valid one.

Another phase of cytology is developed by Dubos in his vol-

ume titled "The Bacterial Cell." He calls attention to the fact that the study of pathogenic bacteria has been concerned primarily with the effect of bacterial cells and their products on the human body. Classifications have been based largely on biological activity, and adequate knowledge of the bacterium as a cell is relatively recent.

With the aid of new techniques, and the recorded details of bacterial structure which the electronic microscope has made possible, the bacterial cell has joined other living cells as a complex individual.

A cell wall is described which stains poorly with dyes, is resistant to chemical treatment, and may consist of cellulose or chitin. Within the cell wall is the cytoplasmic membrane, essentially a dense layer of cytoplasm. It has a strong affinity for dyes, and is assumed to consist of fat or waxes and protein-fat combinations. This cytoplasmic membrane is doubtless the structure which we have stained and identified as the bacterium. The predominance of nucleic acid in young bacteria can explain the ease with which they combine with our basic dyes.

Within the cytoplasmic membrane lie the cytoplasm and its contents. Robinow presents beautiful photographs of chromatinic structures in rod-shaped bacteria from young cultures, of apparent nuclear changes in germinating spores, and of cell division in the genus Bacillus, as well as evidence that resting bacterial spores may contain condensed nuclei.

Outside the protecting cell wall is the capsular material. This is a product of cell metabolism which may adhere to the cell in a layer which can be demonstrated by suitable microscopic methods, or may diffuse into the surrounding medium. In either case it is an important part or product of the bacterial cell.

In the study of blood cells, either by supravital staining or in fixed preparations, we can observe with greater interest and with greater benefit, if we have in mind the details which we cannot see, but which are nonetheless part of what we see.

The microscopy of tissue cells presents continual variations which are understood better today than yesterday. Perhaps the cytologist will be the one to find out what makes the malignant cell malignant.

The radiologist is already using the newer cell information in his development of efficient irradiation therapy.

And bacteria with nuclei certainly have possibilities.

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BLOOD SEDIMENTATION RATE

Technical Consideration and Clinical Evaluation

ELLSWORTH WILSON, B.S., M.D.
Highland, Illinois

Variations in the rate of the sinking of red cells in blood has been observed since ancient times. The Greeks based a theory of disease on the separation into layers of blood collected from ill patients during the process of phlebotomy, a separation obviously due to rapid sedimentation of the cells before clotting occurred.

The first practical application of this phenomenon was made by Fabraeus in 1918 in his attempt to use the sedimentation of red cells for the early diagnosis of pregnancy. The non-specific nature was soon discovered but general interest in the test was aroused by this work of Fabraeus.

The main factor in the sedimentation rate is the clumping of the red cells or the rouleaux formation. This is the actual index of abnormality. The rate of sinking is a simple, if sometimes inexact, measure of the size of the rouleaux.

We are all familiar with the relatively slow sinking of fine grains of sand in water in relation to the rapid sinking of pebbles. Similarly the larger the rouleaux the more rapidly they sink. Fabraeus has shown that not only is the tendency to rouleaux formation greater in disease but the rouleaux are larger and more tightly packed. In the presence of inflammation and tissue destruction there is an increased production of plasma fibrinogen in the liver and the increased fibrinogen content of the plasma parallels the increase of the rouleaux formation.

The sedimentation rate is a simple laboratory procedure to perform, but this very simplicity has resulted in many variations in technique and methods of recording. This in turn has caused confusion and considerable doubt as to the value of the test.

Roughly the test consists of adding an anti-coagulent to freshly drawn venous blood, placing this in an upright glass tube and measuring the rate of descent of the layer of erythrocytes.

Anti-coagulants in general use are sodium citrate in 3.8% solution, heparin and a mixture of ammonium and potassium oxalate. The latter in the form of salts have no effect on the red cells when used in the right proportions, since the ammonium group will tend to increase the size of the cells and balance the shrinking effect of the potassium oxalate. Fluid anti-coagulants introduce the complicating factor of dilution which accelerates the rate of descent of the cells and has to be taken into account. It is important that the proper anti-coagulant for the technic performed should always be used.

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Venous congestion should be avoided in withdrawal of the blood and the test should be run within two hours, although no great change in the rate will occur within four hours. Extreme variations of laboratory temperature will produce results which are not entirely comparable. Any tendency of the blood sample to clot and any gross hemolysis invalidates the result.

The bore of the tube should be greater than 2 mm. In tubes narrower than this it is possible that rouleaux may form of sufficient size to block the tube and cause formation of two distinct layers or retard the sinking of the cells.

The tube should be in an absolute vertical position as any deviation will cause some of the cells or aggregate of cells to slide down the side of the tube and in this manner fail to displace an even flow of plasma upward. This will increase the rate of sedimentation. It has been reported that an inclination of 2% may increase the rate by as much as 30%.

The sedimentation of the erythrocytes occurs in three phases. First is the rouleaux formation which requires approximately fifteen minutes. Then occurs the phase of free fall and thirdly is the phase of slowing as the corpuscles become packed together at the bottom of the tube. Therefore the tube must be of sufficient length so that the packing of the red cells in the third phase does not occur to any appreciable extent during the period of the test.

The main intrinsic factor affecting the rate of sedimentation is anemia. The greater the anemia the more rapid the rate of sedimentation. Methods of correction for this factor have been devised by use of the packed cell volume and graphs which have been set up on experimental basis. These corrections are necessary in the Wintrobe and other methods using the shorter 100 mm. tube but are probably not necessary or desirable in the Westergren Method using the larger 200 mm. tube. The size and shape of the cells are also other intrinsic factors of some importance.

There are at least three ways of recording the sedimentation rate. First, the time necessary for the cells to fall an arbitrary distance may be measured. In a slow rate this may require hours. The second method consists in measuring the distance fallen at the end of an arbitrary time, usually one hour. In the third method the periods of aggregation and packing are avoided and the maximal rate of free fall alone is measured. Although more scientific this latter method involves readings at 5-minute intervals, construction of graphs, including correction for anemia and the working out the maximal fall per minute. This extra time and effort is hardly worth the slight advantage of this method. The second method as used in Wintrobe and Westergren tests is the one most commonly employed.

From a clinical standpoint the physician should accustom himself to one standard method, the technic of which should then be strictly adhered to.

The test to the clinician, while being non-specific, has roughly the same general significance as fever or leucocytosis, although all three are, of course, independent of each other. The sedimentation rate may indicate disease in chronic infections which show no evidence of fever or leucocytosis.

The sedimentation rate may be said to be a measure of the degree of inflammatory changes and tissue destruction taking place in the body. It is accelerated in proportion to the underlying lesion and to the extent of the activity of the pathological process.

The only known physiological factor causing a marked elevation of the sedimentation rate is pregnancy. It begins to rise at about the tenth week and returns to normal at the end of the 3rd or 4th week postpartum.

In healthy females and children the rate may be almost double that for healthy adult males.

There is always a lag of two to three days in the change of the sedimentation rate in relation to the pathological process. Because of this delay the sedimentation rate is of little value in the diagnosis of acute infectious diseases. It is of importance in the prognosis as continued elevation or a rise in the rate will point to some complications.

Thus in the early phases of appendicitis prior to the onset of gangrene or perforation with abscess formation or generalized peritonitis there will be no appreciably change in the sedimentation rate. In salpingitis there will be a marked increase from the onset since this is a complication of a pre-existing condition. The test is of considerable value in differentiating these two conditions. It is also of value in the selection of the optimal time for surgery in salpingitis for when the inflammation becomes quiescent, the rate returns to normal.

In other acute infectious conditions following the period of lag the sedimentation rate is usually increased, except in malaria and pertussis. Whooping cough occupies a unique position in that it is a disease accompanied by fever and a marked lymphocytosis and still has a normal sedimentation rate.

That the sedimentation rate may be increased in the common cold should be kept in mind to avoid confusion in patients suspected of more serious conditions.

The test is widely used as an index of activity in rheumatic fever, arthritis and tuberculosis. It should be emphasized, however, that the rate is usually, but not always, increased in patients with active sputum positive pulmonary tuberculosis.

The test may be of considerable aid in both the diagnosis and prognosis of malignancy. In benign tumors and cysts and frequently in localized malignant tumors without much tissue destruction, as epithelioma, the sedimentation rate will not be increased. It is usually definitely abnormal in rapid proliferating and ulcerative malignant lesions, even in the early stages. In the later stages and especially when accompanied by skeletal metastasis it is grossly abnormal. In peptic ulcer the rate would be normal, while in malignancy of the gastro-intestinal tract, it would be increased. Likewise it is of aid in differentiating tumors of the female pelvis.

In prognosis in malignancy, if the lesion is completely removed surgically the rate should return to normal within six weeks. If the rate is still normal at the end of six months a guarded favorable prognosis can be given. If the rate remains constantly elevated and tends to increase, metastasis and an early death can be expected.

In small localized abscess as apical dental abscess, there may be no change in the sedimentation rate, but in suppurative conditions in general, an otitis media, empyema of gall-bladder or pleural cavity, etc., there will be a marked increase.

In coronary thrombosis and thrombosis in general the rate is increased. In coronary thrombosis the height is usually reached at the end of the 3rd or 4th week and then returns to normal as the infarct heals.

In severe cardiac decompensation the rate is retarded and with the onset of cardiac failure the rate may return to normal. This is presumably due to interference with hepatic function, as it is also decreased in various forms of several liver diseases especially in the chronic stages, such as cirrhosis of the liver.

In leukemia and pernicious anemia there is an increase which is out of proportion to actual anemia.

In acute and chronic nephritis there is an increase during the active stage. In wounds and fractures the increase is in proportion to the degree and extent.

The sedimentation rate may be of some aid in diagnosis of gout, as during the acute attack the rate is markedly increased and following remission rapidly falls to normal.

The test is also of some aid in the diagnosis of acute poliomyelitis as in this disease it quite constantly remains within normal limits.

Last but not least, it should be remembered that in psychiatric and functional disorders the sedimentation rate is not affected.

RINGWORM

By EDITH V. DAMGAARD AND SR. M. ALCUIN, O.S.B.
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(The cases discussed are those of Dr. M. G. Fredricks, Duluth, Minnesota)

The disease, ringworm, is poorly named because of the implications of the word. It is not caused by a worm, i.e., an organism from the animal kingdom, but by species of plants, organisms from the vegetable kingdom. In ringworm the lesions are sometimes rings of inflammation surrounding centers of healthy skin. This is why the disease has been called ringworm.

Ringworm organisms never invade lung, liver, and other deep organs but the parasites grow superficially on smooth, or hairy skin, or on both, and even attack finger nails and toe nails. As a rule the infection begins in a hair follicle from which the inflammation extends to the skin, remaining localized in the superficial layers in some types, and extending to the deeper layers in other types. The organism may or may not invade the hair. If it does, it grows upward for a short distance and destroys the hair as is evidenced bythe loss of luster and its final breaking off flush with the skin, or 2 to 6 mm. above the skin leaving a stump.

How long the organism can live without man or animal as the host is not known. The spores, to be described later, are viable for long periods without contact with life. This perhaps accounts for their contagiousness. The spread is due to contact with the spores through the common use of combs, brushes, towels, drinking cups, or contact with wet floors in swimming pools, or with domestic animals, their stalls, or their litter.

Not one plant only but a number of microscopic plants may cause ringworm. The ringworm plants belong to the least specialized branch of plant life known as Thallophytes. Thallophytes may be green or colorless; colorless, because they lack chlorophyll. The non-chlorophyll containing plants are called fungi (plural) or fungus (singular). To the microbiologist who uses words scientifically, fungus means a true or perfect fungus, as against another division which is untrue or imperfect in certain characteristics. The untrue or imperfect fungi, to which the ringworm organisms belong, are known collectively as fungi imperfecti, plants in which the microbiologist fails to trace the complete life cycle. The origins of these plants are from structures that do not result from the fusion of sex cells.

Unlike bacteria, fungi imperfecti plants when mature are composed of many cells separated from each other by crosswalls or septa. Lying end to end these cells produce a filament called a hypha. Hyphae lying end to end make mycelium, aerial if it extends into the air, ground or vegetative if lying upon or burrowed into the culture medium. The mycelial fibers make no regular pattern like the fibers of woven cloth but grow in a

tangled mass producing a heap of what looks to the eye like wax, velvet, wool, or loose felt, depending on the length of the aerial hyphae. No matter how large such a mass is, it is usually only one plant seldom becoming visible, however, before several days or a week.

From the aerial hyphae, as well as in and on mycelial filaments, a variety of structures develop; some called spores (asexual); others collectively, reproductory forms. It is from these spores, these reproductory forms, and even from "slips" of mycelium that a new plant develops if the environment is favorable. The spores are called microconidia or macroconidia depending on the size. The reproductory structures differ from the true asexual spores in that they are variable in shape and in manner of growth, i.e., when mature are unable to germinate until the vegetative mycelium disintegrates. Furthermore, they are slower at germinating. (Those structures have been variously named, many terms being French because of the prominence of the French Mycologists, Vuillemin and Sabouraud.) Since these reproductory structures are uniquely seen in fungi imperfecti they form a common bond for the ringworm fungi. The most common of these structures are the following:

1. *Arthrospores* or endoconidia (oidia); structures arising from the fragmentation of the vegetative mycelium. These are the spores usually found in the patient's hair or scales of the skin and rarely in artificial culture and then only when old.
2. *Fuseaux* or macrocondia: large structures also known as spindle spores because they are more or less spindle shaped, composed of several compartments each containing a cell, and usually seen on terminal hyphae.
3. *Aleuriospores* or ectoconidia or microconidia: small structures arising from the aerial hyphae laterally or terminally, sessile or pedunculated, and may or may not be separated from the mycelium by cross walls.
4. *Chlamydospores* (Not necessarily peculiar to fungi imperfecti, however): rather large, thick-walled structures that arise in the vegetable mycelium, laterally on short stalks, or in the course of the mycelium as bulging masses (intercalary). They may be regular, or irregular in form, approaching the shape of a spindle spore and composed of several cells.
5. *Pectinate bodies:* hyphae curved at the distal ends and branched so as to give a comb-like structure with widely and irregularly spaced teeth.
6. *Spirals:* Terminal or aerial hyphae curled up to a structure that looks like a corkscrew.
7. *Racquet mycelium:* segments, swollen at one end and lying so that the swollen end of one is adjacent to the normal end of the next cell.

8. *Nodular organs:* structures similar to chlamydospore or sections of racquet mycelium.

One of the most striking differences between ringworm and the other pathogenic fungi is that all the cells including the chlamydospores, spindle spores, and arthrospores contain 2-6 nuclei and divide by amitosis. Aleuriospores, however, are uninucleated.

There are many structures that lie between the chlamydospores and the spindle spores. To decide whether a structure is a chlamydospore, spindle spore, or aleuriospore IS A TASK FOR THE SPECIALIST rather than the medical technologist.

Colony formation makes it possible to identify the genera and sometimes the species within the genus. But all variables such as temperature, the type of culture media, and the rapidity of transfer must be controlled. The optimum temperature is 30° C. but room temperature is satisfactory. (Like all other fungi they grow best in the dark.) The correct type of medium is very essential. All "molds" (fungi) grow well on a sugar enriched medium but the pathogenic grow best on a maltose agar which is essentially like that originally formulated by and known as Sabouraud's agar. (The American brand as dispensed by the Difco Laboratories, Inc., Detroit, Michigan, substitutes dextrose for the maltose and their own brand of peptone but the fungi grow satisfactorily on it.)

The gross characteristics of a ringworm colony are:

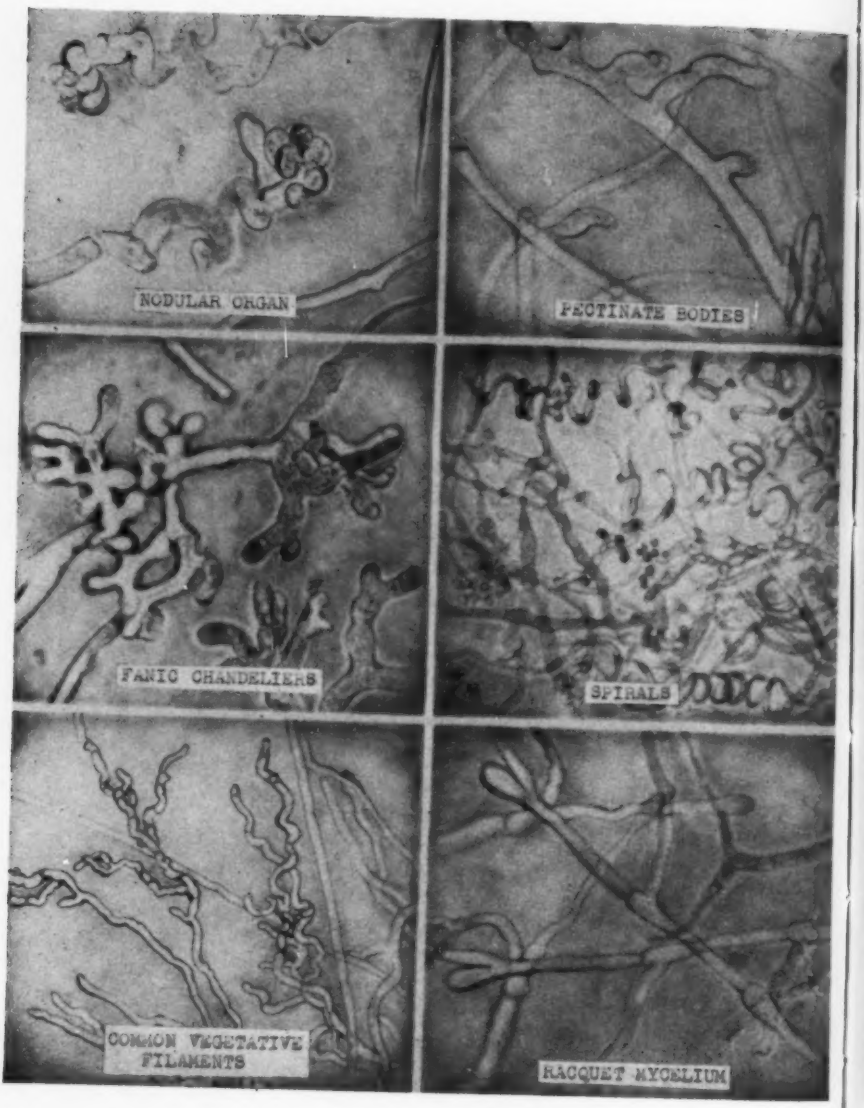
A. *Shape:* A circular, irregularly folded mass—cerebriform
A circular, regularly folded mass—radial
A circular, with irregular periphery, mass—star-like or stellate

B. *Texture:* Smooth or waxy because there are no aerial hyphae
Chalky or velvety because there are many short aerial hyphae
Downy or wooly because there are many long aerial hyphae.

C. *Color:* Rose, yellow, violet, but usually white. The same color does not always persist on the lower side of the growth due to the formation of pigment that may diffuse into the agar under and adjacent to the growth.

All these characteristics do not remain constant for subculturing rapidly may inhibit pigment formation, or may change the texture of the colony due to the appearance of sterile hyphae in various regions on the surface, eventually to overrun the entire surface. On long subculturing most fungi produce similar white, fuzzy colonies that have atypical structures and no pathogenicity.

To study the mold microscopically the binocular or dissecting microscope is the most helpful instrument, but without it an inverted eye piece from a compound microscope placed on the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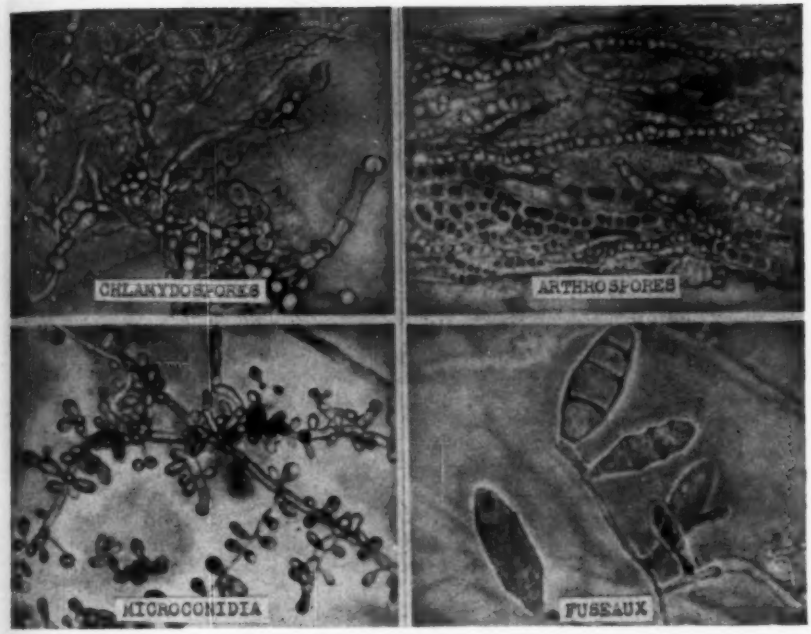
SPIRALS
COMMON VEGETATIVE FILAMENTS
RACQUET MYCELIUM



glass above the growth will, under proper illumination, make it possible to see when the eye is tight against the other end of the ocular.

Carefully removing the "fuzz" from a growth by means of a sterile dissecting needle or forceps and teasing it apart in a drop of water on a microscope slide will demonstrate the filaments so that one may see the cross walls if they are there, the aerial hyphae and whether they are branched or not, the spores, their size and shape, and the presence or absence of any of the other reproductory structures.

Carefully removing a diseased hair or scale from the skin and coverslipping it with 20 per cent sodium hydroxide for one-half hour dissolves the epithelial tissue sufficiently to demonstrate the mycelium and the arthrospores, and their relative positions.

Since the relation of the spores to the hair is somewhat diagnostic this type of preparation helps in identifying the organism. However, the duration of the infection, and the degree of inflammation determine somewhat whether the spores are inside or outside of the hair.

At one time attempts had been made to classify ringworm organisms according to types of spores; at another, according to the lesion produced in the animal. No characteristic structures are fundamental enough to establish a genetic relationship between the various organisms. It follows, therefore, that to try to classify fungi imperfecti on a purely botanical basis is futile. As to the pathogenicity, there are those fungi strictly parasitic to man only, those to animals only, and those to man and animal. Again as to pathogenicity, a number of species may cause the same type of lesion. Thus, this type of classification is limited in its diagnostic purposes. But a key to the chief group of fungi imperfecti of the ringworm type may be based very largely on clinical characteristics, the main group writing as Dr. Henrici says, their own label so to speak, on the skin. However, the following is an adaptation from Henrici's key in which clinical and botanical features are combined.

Achorion is not considered with the ringworm by Henrici.

Microsporum. This genus is almost always restricted to the scalp, various species causing ringworm of the scalp in CHILDREN, the lesions healing spontaneously with puberty. (Adults may work with some species of these organisms without fear of autoinfection.)

There are at least 16 species of Microsporum, four of human origin and the others of animal. *M. lanosum* (canis or felineum) is seen in adults. The species is not so contagious, causing only family epidemics of short duration, the organism being cultured easily. A definite white growth appears the fourth or fifth day that is woolly, flat-centered, and non-folding.

It elaborates a tawny pigment that diffuses into the agar adjacent to and beneath the colony. Fuseaux, chlamydospores, sessile and pedunculated aleuriospores are seen in the culture. With age many pleomorphic characteristics such as terminal spindle spores, and arthrospores may develop. This organism has been isolated from horses, cats, dogs, and chickens.

M. audouini is of human origin, growing more slowly than M. lanosum. It is hard to treat, is seen almost exclusively in children and may be the cause of a school epidemic. Through the courtesy of Dr. M. G. Fredricks, it was possible to observe the clinical features of this type of ringworm in three children, a girl about six years old, a boy about eight, and a girl twelve years; and to study M. audouini culturally.

The lesion in this and other microspores is a "moth-eaten" spot due to the hair being regularly broken off 2-6 mm. above the skin, and varies in size from a pin head to lesions one-half inch in diameter. The younger children had lesions of this description. In some instances the whole scalp is involved. The older child had a lesion as vast as that. Species of Microsporum and others fluoresce in the presence of a Wood's light in an otherwise dark room. The several lesions on the younger children and the whole scalp of the older girl glowed a bright green when subjected to these ultra violet rays.

In culture a white powdery colony with a central knob and radial furrows of 4-6 clefts appears the seventh day. When held to a light a distinct yellow color is noticed on the underside of the growth. The reproductive growth forms, while resembling those of M. lanosum appear to be aborted. For instance, the fuseaux are chamberless, the aleuriospores more like buds and the racquet mycelium and pectinate bodies seem patternless.

Through the experience of Edith Damgaard the following technique leads to successfully culturing M. audouini (and may be applied to other fluorescing ringworm organisms).

The utmost care must be taken in obtaining the specimens for culture. Diseased hairs and scales of the skin carry the organism. Have the patient seated in a dark room under a Wood's light (a Westinghouse Purplex 250 W - 115 V bulb is satisfactory for this purpose). Examine the scalp for infected hairs which will fluoresce strikingly bright green in small areas or over the entire scalp.

With sterile forceps remove several fluorescent hairs with the roots. Cut off all but the fluorescent part with sterile scissors. Immerse the infected hair in 70 per cent ethyl alcohol for two minutes and plant one hair on one slant of Sabouraud's agar, making six or more inocula from the same scalp to ensure at least one pure growth. There is an almost unavoidable contamination of some of the cultures due to the prevalence of other mold spores in the hair. The cultures are kept at room temperature in the dark.

Note—Care of instruments. Place used instruments in two per cent solution of lysol for at least one-half hour. Precaution should be taken to prevent the spread of contaminated material by wrapping the diseased hairs in paper and burning them.

Trichophyton, variety *ectothrix* is a fungus found on such animals as horses, cats and dogs, and on man. In man it is found on smooth as well as on hairy (scalp, beard) skin. If in hairy regions the mycelium threads grow on the inside and outside but mostly on the outside forming parallel rows of spores. On the basis of size of spores there are two varieties, the microspore with a spore

diameter about a half of the diameter of a red blood cell; and the macrospore with a diameter about the size of a red blood cell. The micro, or small spore variety usually develop circular lesions on extensor side of the fore-arm in adults, but in children the same lesions may be seen on the scalp, the face, and the hands. The lesion in the hairy areas is a bald spot because the hair breaks off flush with the skin. There is much inflammation, exudation into the skin making the lesion boggy and deep, with pus oozing especially from the hair follicles. When such an inflamed purulent area is seen in the scalp it is called a "kerion," when in the beard a "sycosis." The lesion in smooth skin is usually found in sweaty areas like the skin between the toes. Athlete's foot is the term sometimes applied to this condition.

In culture Trichophyton ectothrix produces a colony that is star-like because hyphae radiate from the center toward the periphery. Among small spore Trichophytons are: Tr. gypseum (asteroides) the surface of which is "plaster like," creamy white with septated mycelium demonstrating aleuriospores, spindle spores and spirals. Among the large spore Trichophytons is Tr. rosaceum which grows downy white compact colonies with radial grooves and becomes rose-colored. No fuseaux are seen but it grows aleuriospores. In time it demonstrates many pleomorphic structures.

Trichophyton variety *endothrix* is characterized generally by the presence of both mycelium and spores inside the hair, the spores being in regular parallel rows. The lesion is a bald spot. In culture the conidia are on short stalks. The organism is only pathogenic to humans and in children may persist beyond puberty. Fourteen or more species are known of which Tr. violaceum is an example. It grows a violet colony, the violet color changing in sectors to paler shades with continuous culturing, and is smooth because no spores grow artificially. Other species are Tr. acuminatum and Tr. crateriforma.

Trichophyton variety *neo-endothrix* is an organism transitional between ecto and endothrix, closely resembling endothrix except for a few mycelial filaments and arthrospores found outside the hair and is animal-contracted. Tr. cerebriform and Tr. plicatile are its best known species.

The Epidermophytes and Endodermophytes are strictly human parasites found on smooth skin. Epidermophyton attacks the moist skin and causes eczema-like lesions and in culture spindle spores but no conidia while in the scales of the diseased skin arthrospores appear. Some well-known species of this genus are: Epidermophyton cruris (inguinale) and E. rubrum (purpureum).

Endodermophyton organisms involve deeper layers of the skin and form rings of inflammation that follow real patterns like tattooing.

Since ringworm due to Microsporum is prevalent in more temperate climates, M. audouini being the usual cause of epidemic ringworm of the scalp in the United States, these Epi and Endodermophyton types of ringworm are less often encountered because they are more frequently seen in hot climates.

Summary and conclusion:

A discussion of ringworm has been made showing that the causative organisms are plants belonging to the subclass Fungi Imperfecti, and that the infection is limited to the skin, producing characteristic lesions. The cultural characteristics have been reviewed and several clinical cases presented to show the application of cultural technique and corresponding findings. It may be likely that medical technologists will see more of the Trichophyton and Microsporum types of ringworm than those of Epi or Endodermophyton types because of the temperate climate of the United States.

REFERENCES

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2. Henrici, A. T.: Molds, Yeasts and Actinomycetes, New York. John Wiley and Sons, Inc.: 1930.

ACCURACY AS A QUALITY ESSENTIAL TO THE MEDICAL TECHNOLOGIST

By ROSE M. HACKMAN, M.S., M.T. (ASCP)
Instructor in Biochemistry (Medical Technology), University of Colorado School of Medicine and Hospitals, Denver, Colorado

One of the essential qualities of a good technologist is accuracy. Accurate results in the laboratory are dependent upon a number of important factors, several of which are: scrupulously clean glassware; meticulous observation of all conditions stipulated in the procedure; exact measurements with pipette, burette or volumetric flask; and thorough mixing of samples to insure homogeneous solutions. When the actual anaylsis of a sample has been made or a test has been done, the next step may be to make a more or less complicated computation. When the final result is obtained, it must be carefully recorded on a laboratory slip, on the patient's chart, or on some other record.

For correct results in any of the steps mentioned above that constitute the performance of a laboratory test, the doctor is almost entirely dependent upon the carefulness and conscientious attitude of the laboratory worker. On the whole, the laboratory technologist works independently of other persons, and the results obtained by him are not often questioned by the doctor or checked by another person in the laboratory. This means that every worker must have self-assurance that he is carrying out the specified procedure accurately and that he is making the correct calculations from the data obtained. The assurance that he is carrying out the procedure correctly will come largely from experience and because he is constantly alert to signs which indicate that something is wrong with the test. However, he must also be certain that there is no error in any step in the calculation of his results.

The majority of persons are only fairly accurate in the use of figures. Many are grossly inaccurate, and they seem to excuse themselves by saying, "I never *could* get the same answer twice." This should not, however, be a comfort or an alibi, for it is entirely possible for anyone to develop extreme accuracy with figures if only there is a will to do so. To check a calculation it is not enough merely to recheck the figures as they stand, for exactly the same mistake may easily be made when the calculation is repeated the same way the second time. To obtain an adequate check, the places of the figures may be exchanged, or the answer may be used in a calculation that will yield one of the original figures, or a change may be made in the steps of the calculation.

To check multiplication, exchange the multiplicand for the multiplier; for a check of subtraction, add the subtrahend to the difference; to check division, multiply the divisor by the quotient; for addition, add the columns of figures in opposite order, once from the top and once from the bottom. It is an excellent habit to use simple arithmetic for one calculation and logarithms or the slide rule for a check, or vice versa. How the calculation shall be checked must be left to the ingenuity of the technologist.

Inaccuracies in calculation may easily result in errors of several hundred per cent, errors which might be much greater in magnitude than any that would be likely to occur from carelessness in technique. As the doctor depends on the technologist for a correct report, the grave responsibility of the technologist is evident and the importance of unrelenting observance of accuracy cannot be over-emphasized.

"Whatever is worth doing at all is worth doing well."—Earl of Chesterfield.

TIMELY THOUGHTS—EDITORIAL

On November 17, 1944, President Roosevelt wrote to Dr. Vannevar Bush, Director of the Office of Scientific Research and Development, and President of the Carnegie Institute, asking what the government could do in the post-war era, first to keep united at the front in advance of science; second, to further scientific research in medicine, related sciences, and the natural sciences; third, to aid in recruiting scientific talent in American youth to keep the scientific level reached during the war high enough to defend the United States against external and internal enemies: disease, national insecurity, unemployment, lack of national health, and poor economic welfare.

Bush's report came under the caption: "Science, the Endless Frontier" and suggested creation of a government agency called "The National Science Foundation" which would consist of

a. A governing board—nine members to be selected by the President of the United States on the basis of qualifications who, through audited reports, would keep the government informed on expenditures but in all things else act independently of governmental interference.

b. Professional divisions, (1) Medical research, (2) Natural science, (3) Natural defense, (4) Scientific personnel and education, (5) Publications and scientific collaboration; and

c. Financial support by the federal government through, (1) Matching grants, (2) Bestowing discretionary grants, and (3) Fellowships (900) and scholarships (24,000).

A bill formulated on the plan and creating the agency was introduced in Congress on January 30, 1946, as the Willis Bill, Senate 1777, and its companion was introduced February 21, 1946, as the Kilgore-Magnuson Bill, Senate 1850. The latter detailed the powers and responsibilities of the Agency.

The bills failed in the 79th Congress. Their failure as drafted was due to opposition on the part of scientists to the Bush plan because it excluded the social sciences, and the interests were directed toward the large corporations and large universities of the northeast. Revisions of these bills are being considered by the 80th Congress.

These bills are being discussed briefly here to arouse ASMT interest in participating in their execution, once passed. Should not the ASMT watch for an opportunity to broaden and coördinate a plan of scientific research in the laboratories of United States research centers, industrial organizations, and governmental agencies?

Sr. M. Alcuin, O.S.B.

NEW BOOKS AND EDITIONS

HYGIENE: A TEXTBOOK FOR COLLEGE STUDENTS ON PHYSICAL AND MENTAL HEALTH FROM PERSONAL AND PUBLIC HEALTH ASPECTS. By Florence L. Meredith, B.Sc., M.D. Fellow of the American Medical Association, American Public Health, and American Psychiatric Associations; Professor of Hygiene and Public Health, Tufts College. Fourth Edition. One hundred and fifty-five illustrations and figures. 837 pages. Philadelphia and Toronto. The Blakiston Company 1946. Price $6.00.

In its field, this book is unequaled, for it contains the minimum which every intelligent individual should know about the principles of health and the manifestations of disease. Detailed consideration is given to physical and mental health from personal and public health aspects. The treatment of the material is excellent and scientific terminology is used minimally.

The book is divided into nine sections, as follows:

I. The Health Situation in the United States (a statistical survey).

II. The Body in Health and Disease. (Includes chapters on the general plan of the body, systematic work of the body and, disease and recovery.)

III. Forces for Health. (An excellent survey of the health problem of today in five chapters. The chapter on the Use of Medical Service is truly a classic.)

IV. The Problem of Infection. (A concise description of germs, infection, asepsis, infection and immunity, and, the major infectious diseases in lay language in six chapters.)

V. Other Major Health Problems. (Cancer, diabetes, endocrine gland disorders, blood, kidney and joint disorders and, intestinal and allergic conditions are discussed.)

VI. Accidents and Poisoning. (Five chapters evaluate this subject.)

VII. The Hygiene of Everyday Life. (Twenty-one chapters are devoted to the entire field.)

VIII. Reproduction. (Includes three chapters—Reproductive functions, heredity, and parenthood.)

IX. Mental Health, (The series of five chapters give a broad view of this topic.)

Supplement. (Lists the chemical composition of American foodstuffs in table one, and one hundred calorie servings of foods in table two.)

This text should become a welcome addition to the curricula in schools of medical technology, especially those which accept students with only two years of college work, for the material in this book should be a part of every technician's background.

As a layman's book, the volume is priceless because this book contains authoritative up-to-date information concerning the present day health problem in its various aspects.

The style is direct and the text is as readable as the average magazine article.

CLINICAL LABORATORY DIAGNOSIS. By Samuel A. Levinson, M.S., M.D., Ph.D., Director of Laboratories, Research and Educational Hospitals, Chicago, Illinois, Professor of Pathology, University of Illinois, College of Medicine and Robert P. MacFate, Ch.E., M.S., Ph.D., Assistant Director of Laboratories, Research and Educational Hospitals, Chicago, Illinois, Assistant Professor of Pathology, University of Illinois College of Medicine. Third edition. One hundred and ninety-two engravings and fifteen plates, seven in color. Nine hundred and seventy-one pages. Philadelphia, Lea and Febiger. 1946. Price $10.00.

This volume should be among the required texts in schools of medical technology. There are many outstanding features not found elsewhere in this book. Of particular significance in the presentation of the subject matter is the correlated brief review of anatomy, physiology, biochemistry, and other pertinent data which is given before the actual tests are described and evaluated on the various body fluids. (Moreover, if a student medical technologist is trained to anticipate the possible tests which may be indicated in the various pathologic disorders, that technician has something to give beyond the required minimum and certainly should be in a position to aid the diagnostician when others may have failed. This book offers such a background to students.)

This text is divided into twenty chapters. The sequence of the subject matter is somewhat heterodox, but if strictly followed the approach is entirely logical. The complete gastro-intestinal tract is considered first. Chapter I is devoted to the study of the mouth and its accompanying disorders; Chapter II takes up the stomach and includes a discussion of gastric digestion, test meals, the various methods for the examination of the stomach and stomach contents, the significance of the various laboratory findings, and a resume of gastric diseases and syndrome complexes; Chapter III is limited to the duodenum and related organs including the liver, gall-bladder and pancreas—an excellent appraisal of liver function tests is also included; Chapter IV deals with the intestine and the examination of feces including the chemical, macroscopic, and microscopical examinations are discussed as well as the various intestinal disorders; Chapter V takes up metabolism of carbohydrates, nitrogen, fats, organic acids, minerals, water, acid-base balance and also, basal metabolism is reviewed—the significant tests used in the various metabolism tests are discussed and evaluated; Chapter VI gives a broad approach to the clinical chemical analysis of the blood and, penicillin assay is included; Chapter VII is devoted to the kidneys and urine and provides a discussion on the normal and pathologic conditions of the kidneys and urine, of the various kidney function tests, and other pertinent data on this subject; Chapter VII is a continuation of Chapter VI and contains the various chemical procedures used in quantitative urine analysis; Chapter IX is a complete chapter on the present day practice of hematology and includes all the tests necessary for establish-

ing diagnoses in the various blood disorders; Chapter X evaluates the tests used in immunology and serology such as agglutination, precipitation and complement fixation tests; Chapter XI presents the cerebrospinal fluid; Chapter XII reviews transudates and exudates; Chapter XIII gives the clinical applications of applied bacteriology; Chapter XIV is a detailed discussion of the sputum in health and disease; Chapter XV presents the accepted technics on skin tests and other biologic examinations; Chapter XVI is a monumental work on the laboratory methods used in Pediatric Procedures which was written by Dr. Henry G. Poncher, Professor of Pediatrics at the University of Illinois College of Medicine and includes invaluable suggestions and methods as well as a complete survey of the stomach contents, duodenal fluid, stool, urine, blood and blood disorders, blood chemistry and cerebrospinal fluid; Chapter XVII is an introduction to the principles underlying the clinical study of tropical diseases and includes the salient diagnostic tests used in establishing a diagnosis of the various tropical diseases and fevers; Chapter XVIII gives an outline of milk and water analysis; Chapter XIX is an outlined chapter on histologic technic; Chapter XX presents the problem of legal medicine and toxicology. An appendix supplies data on the preparation of normal solutions, a method for calculating dilutions, sterilization, important laboratory notes, antidotes for poisons, normal weights of viscera, conversion factors, atomic weights, and an outline of the important laboratory tests in the common diseases.

This book is the most recent of all clinical pathology texts, and while certain tests and technics have been omitted, the excellent and outstanding chapter on pediatric procedures offsets these omissions, for the material which has been included is both up to date and authoritative.

In the opinion of the reviewer this text is well worth the purchase price, and is a book which should be found among the references in all clinical laboratories.

TRICHINOSIS: By Sylvester E. Goulds, M.D., D.Sc., Pathologist and Director of Laboratories, Eloise Hospital, Eloise, Michigan, Assistant Professor of Pathology, Wayne University College of Medicine, Detroit. Three hundred and fifty pages and one hundred and twenty-eight figures. Springfield, Illinois, Charles C. Thomas 1946. Price $5.00.

Dr. Gould's book on Trichinosis is a monograph which offers a complete survey of the trichinosis problem. There are thirteen chapters in the book on the following subjects: historical, life cycle, morphology, epidemiology, trichinosis in animals, pathology, immunology, laboratory diagnostic methods, symptomatology, diagnosis, treatment, prognosis, and control methods.

The chapter on the laboratory diagnostic methods holds particular interest for medical technologists, for each test is con-

sidered in detail and evaluated for its merit. Because the subject of trichinosis is so vitally important to community health throughout America, and because trichinosis can be diagnosed by laboratory methods, schools of medical technology should welcome this book.

Medical technologists devoted to parasitological work exclusively will find this book good reading as the problem of trichinosis is presented in its entirety.

PROTOZOOLOGY. By Richard E. Kudo, D.Sc., Professor of Zoology, The University of Illinois, Urbana, Illinois. Third edition. Three hundred and thirty-six figures showing two thousand and forty-one illustrations. Seven hundred and seventy-eight pages. Springfield, Illinois, Charles C. Thomas. 1945. Price $8.00.

The reviewer especially requested this book for review because it is recognized as one of the outstanding texts of protozoology today and also because it provides an abundance of information on the common and representative genera and species of all groups of protozoa including both the free-living and the parasitic. The entire subject of protozoology is fully covered and the essential material concerning the parasitic forms as well as the non pathogenic is incorporated. The subject matter is comprehensive and up-to-date. The book is written in a free and concise outline style, thus making ready reference possible in the least time.

For those interested in protozoa as agents of disease and, a reference text for related forms, this book will adequately fill such a need as the profusion of illustrations greatly enhances the value of this volume.

CLINICAL BIOCHEMISTRY. By Abraham Cantarow, Professor of Physiological Chemistry, Jefferson Medical College; formerly Associate Professor of Medicine, Jefferson Medical College, and Assistant Physician, Jefferson Hospital, and Max Trumper, Ph.D., Lt. Commander H(S) USNR, Naval Medical Research Institute, National Naval Medical Center, Bethesda, Md.; formerly in charge of the Laboratories of Biochemistry of the Jefferson Medical College and Hospital. Third edition. Six hundred and forty-seven pages. Philadelphia and London. The W. B. Saunders Company. 1945. Price $6.00.

Although written for the clinician, this book contains material which is invaluable to the medical biochemist and chemical technologist in the clinical field. Moreover, it is also essential that the technologist engaged in clinical chemistry have a clear understanding of the significance and limitations of the results of biochemical investigations.

Trumper and Cantarow's Clinical Biochemistry is a masterpiece for it contains the accepted knowledge concerning the chemistry of both abnormal and normal body physiology and

metabolism. The style is direct and forceful. Highly theoretical chemistry and complicated reactions are omitted.

The metabolism of carbohydrates, proteins, lipids, calcium, inorganic phosphorus, phosphatase activity, magnesium, iron, sulphur, iodine, sodium, potassium and chlorides, water balance, and acid-base balance is discussed in detail from the practical point of view. Chapters on the respiratory exchange and basal metabolism, the vitamins, diabetes mellitus, renal function, nephrosis, hepatic function, chemical investigation of gastric function, pancreatic function, cerebrospinal fluid, biochemical changes in pregnancy and lactation, hormone assay and endocrine function (written by A. E. Rakoff) and, an outline of chemical abnormalities found in various disorders compose the remainder of the book. The discussions are full, but not over-detailed.

This book has impressed the reviewer as one of the books which belongs on every general and biochemical laboratory shelf. The description of methods and the citation of references offer a manual, a text, and a reference which is authoritative and up to date, and which gives the material that is so essential to modern chemistry in clinical practice.

HUMAN BIOCHEMISTRY. By Israel S. Kleiner, Ph.D., Professor of Biochemistry and Physiology, New York Medical College, Flower and Fifth Avenue Hospitals; formerly Associate, The Rockefeller Institute for Medical Research, New York. With seventy text illustrations and five color plates. Five hundred and seventy-three pages. St. Louis, Mo. The C. V. Mosby Company. 1945.

As an intermediate text of biochemistry this book fulfills a distinct need. The author deserves credit for clarifying many of the poorly understood principles of physical chemistry as applied to biochemistry. His approach throughout the entire book is one of explanation, thus making the text easy to read and understand. All the essentials in biochemistry are included. A profusion of formulae and biochemical reactions show many biochemical relationships which are fundamental in understanding just how various body reactions take place.

Students of medical technology who desire a short text will find this book a useful reference. Older technologists who would like an up to date book which takes up newer knowledge in basic biochemistry will find this book an adjunct toward a refresher course on the subject.

This text is devoted solely to the principles of human biochemistry and is not a text nor a reference of clinical biochemistry. Nevertheless this does not detract from the value of the book as a text and ready reference on the basic principles underlying the study of biochemistry.

BOARD OF DIRECTORS

Mr. Louis Herring was graduated from the U. S. Navy Medical School, Washington, D. C., in 1926, after which he served with the navy four years in the tropics. He was with the U. S. Marines during the Nicaraguan Rebellion of 1927-28. From 1932 until 1942 he was Senior Medical Technician, Orange General Hospital, Orlando, Florida, and was instructor in Bacteriology and Chemistry. During the next three years he was Senior Chemist in the U. S. Army Station Hospital, Army Air Base, Orlando. He is now the owner and manager of the LOUIS C. HERRING & CO., Importers and Breeders of Laboratory and Experimental Animals. Mr. Herring has been engaged in research work with the Xenopus frogs for pregnancy testing since 1940. He was president of the Florida Society of Medical Technologists (1940-41) and has been a member of the Board of Directors of the ASMT since 1941. His paper, "An Unrecorded Member of the Genus Eberthella," won the ASMT first award in 1942, and another, "Use of Xenopus Laevis for Pregnancy Testing," won the second award in 1943. Mr. Herring is married and is the father of fifteen-year-old Dorothy.

Mrs. Evelyn Jardine began her career as a teacher in an Indian school, St. Marks, in Nanana, Alaska, after which she was an Educational Director with the Episcopal Church in Rhode Island. She studied medical technology in Boston, then went to the Mary Hitchcock Hospital in Hanover, New Hampshire, as head medical technologist in 1935, where she is continuing her work as head of the training school. (None of her graduates have ever failed the Registry examination.) She organized the New Hampshire Society of Medical Technologists, and is a member also of the Dartmouth Scientific Society. Her hobbies lie in the line of flying a plane—she was a member of the C.A.P. during the late war—and New England ranching. When Mrs. Jardine was president of the ASMT, her single-handed efforts launched the bill for commissioning registered Medical Technologists in the army and navy, and through her organization, had the membership do their part to foster the bill. She was president of the American Society for two years, 1942-4, and has been on the Board of Directors since July 1, 1944.

These two members of the Board of Directors have one more year to serve in that capacity.

NEWS AND ANNOUNCEMENTS

The American Society of Medical Technologists. Fifteenth Annual Convention.

Hi pardner,

With this friendly greeting, the ASMT welcomes Medical Technologists, Honorary members and guests to the 1947 Convention, the fifteenth annual meeting, in Denver, Colorado—June 30, July 1 and July 2, 1947.

The Shirley-Savoy Hotel, located on Seventeenth and Broadway, just in the center of Denver's activity will be the meeting place. This fine hotel is placed in the most strategic position, for you can see it far up on 17th street from the Union Station, and it is right on the highway into the bus stations. It is easily reached by street cars, and is the pivot of the city's activity. Just a few blocks south of the hotel is the Capitol Building, and near by, the Civic Center. Downtown a short distance are the business locations; and street car and bus service will take you quickly to nationally famous Elitch's Gardens and Lakeside Park toward the western limits; or eastward to City Park and other points of scenic interest.

Tours are being arranged to visit some of the well-known hospitals while technologists are waiting for trains, planes, and buses after the convention is over. Thursday morning, July 3, is the day for these trips.

The hotel is arranged to accommodate the fine exhibits, both scientific and technical, which are being planned by the national committee. These will be open for visitation during the Convention, and Tuesday afternoon there will be time for visits after the House of Delegates Session. The program committee will feature a Panel Discussion on Public Relations, and the formal program of speakers and discussions is in the making. Complete plans will be announced later.

The House of Delegates meeting on Tuesday will be an important one, since the revisions to Articles of Incorporation and By-Laws will be presented for vote. Encourage registered technologists to become members of the ASMT and urge upon them the need of good organization.

Turning from the scientific part of our meeting to enjoyment of the surroundings, the scenery (of which there is no limited amount or variety) will be available in all its glory. One tour is being planned for Monday afternoon and evening with a special "Out West" dinner and entertainment in the hills and mountains west of the "Mile High" city. Definite prices and plans cannot be given here, but will follow as will the information concerning the luncheon on Tuesday, July 1, and the banquet on Wednesday, July 2.

A formal announcement will reach each one of you, sent by the Colorado State Society of Medical Technologists. LOOK FOR IT!

The reservations for the Sisters attending the convention must reach the Committee by May 1, 1947. Sister Mary Thecla, Mercy Hospital, Denver, is in charge of the accommodations.

The committee on registration is planning to make the convention start with real western hospitality and preparations are on the way to that effect.

This year will be the twentieth for the Registry, and Homecoming will be emphasized in Denver. You will hear more of that as time goes on.

There can be no doubt about the success of this convention if everyone will attend and enjoy the many features offered.

The gay sunshine and splendid scenery of Colorado will be at its best. In Denver itself will be all the facilities of a large city, the center of the mountain states activities. Not many miles away is Central City where the Central City Opera gathers celebrities for revivals of many famous performances held in the olden days of the "gold rush." Cheyenne, Wyoming, is a few short hours from the Convention city and if your vacation time is at hand, the Rodeo will be coming along. That is the western scene which features the rip-roaring, gay, colorful life of the cowboys on the range. Other rodeos are in progress in July. South of Denver some seventy-five miles is scenic Colorado Springs and its mountain splendor. Pike's Peak, the Garden of the Gods, and Mt. Manitou Incline, furnish historic and beautiful settings for many trips and tours. The Broadmoor Hotel, at the foot of Cheyenne Mountain where the Will Rogers Shrine is located, will thrill you completely. South, another forty-five miles is Pueblo, the "Little Pittsburgh" where hospitality bids you—Come one, come all.

Gay sunshine and cool mountain breezes will warn you that you need to bring wraps for the cool evenings and plan your wardrobe to enjoy the full effects of the solar diathermy.

The great open spaces are waiting, and the friendly hospitality of Colorado welcomes you to the 1947 ASMT Convention at the Shirley-Savoy in Denver, June 30, July 1 and July 2.

ASMT.
Fifteenth Annual Convention
Denver, Colorado.

Shirley-Savoy Hotel, headquarters. June 30, July 1 and July 2, 1947, for information

Miss Elizabeth O'Toole,
Chairman of local arrangements,
1345 Elati Street
Denver 4, Colorado.

CONVENTION PROGRAM HIGHLIGHTS

The deadline for papers to be received by the Program Chairman is APRIL 10, 1947.

Only members of the A.S.M.T. are eligible for the Convention Awards which are as follows:

First Award—$50.00 and a gold medal.
Second Award—$30.00 and a silver medal.
Third Award—$15.00 and a bronze medal.

Panel discussions are to be featured on the program. There will be a panel on "Public Relations" which will be organized with speakers who have contributed much of their time and services to our association.

The subjects for the scientific panels have not been selected at this time. The papers received will be selected for the panel or for the regular scientific program, depending upon their subject matter. Whether the papers are selected for the panel or for the regular program, they are eligible for the convention awards and for publication in the Journal, provided they meet the qualifications specified in the January (1947) A.J.M.T.

The speakers will be allowed twenty minutes for their papers, with a ten minute discussion and question period. The speakers for the panel will be allowed six minutes to present their subject, but should also be prepared to answer or discuss problems directed to them in a three minute period.

Watch for the complete program in the May Journal.

Miss Pauline Kurachi, Chairman
Colorado State Hospital,
Pueblo, Colorado.
Miss Eunice Reinhardt
St. John's Hospital,
Springfield, Illinois.
Mr. Homer L. Spencer
411 Medical Arts Bldg.,
Tulsa 3, Oklahoma.

SCIENTIFIC EXHIBITS

Scientific exhibits are open to both individuals and to local or state organizations. Awards of $35 will be made respectively to the best exhibit presented by an individual and to that presented by an organization. Please submit your request for space together with the title of your exhibit to:

Miss Vondell Stewart, Chairman
St. Joseph's Infirmary,
Houston 3, Texas.

REPORT OF NOMINATING COMMITTEE (1946-1947)

The following members of the American Society of Medical Technologists will be presented for the vote of the House of Delegates at its annual session in Denver, Colorado, July 1, 1947:

For President-elect (one to be elected)

MISS RACHEL LEHMAN, Indianapolis, Indiana.
Member of A.S.M.T. since 1939.
Secretary of Indianapolis S.M.T. (1937). Served on Program Committee.
President of Indiana S.M.T. and served on Program Committee.
Served as member of Program Committee of A.S.M.T. (1941), Nominating Committee (1946), Chairman of Education Committee since 1945.
Member of Indiana Academy of Science.
Member of the Advisory Committee of M.T.s to the Board of Registry of M.T. (A.S.C.P.).
Presented paper before A.S.M.T. Convention (1946), "Preparation and Presentation of Teaching Materials for Clinical Laboratory Demonstration," published in A.J.M.T., Sept. 1946, Vol. 12, No. 5.

MRS. MABEL (STEWART) MILLER, Denver, Colorado.
Member of A.S.M.T. since 1939.
Charter Member of Colorado State S.M.T. Served as President two terms. Served on Executive, Program, Ways and Means, Education Committees.
Chairman of Program Committee of A.S.M.T. (1944-45).
Active member of Sigma Xi.
Presented paper before A.S.M.T. Convention (1944), "The White Blood Cell Picture in Virus Diseases With Special Reference to Colorado Tick Fever," published in A.J.M.T., Jan., 1945, Vol. 11, No. 1.

For Recording Secretary (one to be elected)

MISS IDA REILLY, Roanoke, Virginia.
Member of A.S.M.T. since 1938.
President of Roanoke S.M.T.
Counsellor for the Southeastern States District in A.S.M.T. Has served on Nominating Committee. Is member of Committee on Articles of Incorporation and By-Laws.
Member of Alpha Zeta Chapter of Phi Sigma (biological fraternity).
Presented paper before A.S.M.T. Convention (1939), "Factor Supporting Filament-Non-Filament Differential Counts," published A.J.M.T., May, 1940, Vol. 6, No. 3.

MISS LUCILLE GODELFER, New Orleans, Louisiana.
Member of A.S.M.T. since 1940.
Served as Vice-President and President of New Orleans S.M.T. Member of Executive Board.
President-elect, President of Louisiana State S.M.T.
Counsellor of Gulf States District in A.S.M.T.
Presented paper before A.S.M.T. Convention (1944), published in A.J.M.T., May, 1945, Vol. 11, No. 3. Presented paper for publication in A.J.M.T., "Dental Caries," published in A.J.M.T., Jan., 1947, Vol. 13, No. 1.

Board of Directors (two to be elected)

MR. OSCAR STEWART, Tulsa, Oklahoma.
Member of A.S.M.T. since 1943.
President of Tulsa Round Table of M.T.
President of Oklahoma S.M.T. (1945-46).
Chairman of Commercial Exhibits Committee (1946). Chairman of Committee on Articles of Incorporation and By-Laws (1946-47), for A.S.M.T.

MISS MARY EICHMAN,
Philadelphia, Pennsylvania.
Member of A.S.M.T. since 1935.
President of Pennsylvania S.M.T. and L.T. (1942-43). Served three two-year terms on Advisory Board, and on Membership, Program, and Entertainment Committees.
President of A.S.M.T. (1946-47). Served as President-elect (1944-46), Recording Secretary (1942-44). Served on Entertainment Committee (1942).
Member of Western Penna. Chapter of Society of American Bacteriologists.
Member of Advisory Committee of M.T. to Registry of MT (ASCP) 1945, Chairman 1946-47. 1946-47.

MISS JEANNE JORGENSON,
San Francisco, California.
Member of A.S.M.T. since 1943.
Served on Exhibits Committee of California Ass'n of M.L.T. for state meeting and is member of San Francisco Chapter.
President of newly organized California S.M.T.
Counsellor for the Western States District of A.S.M.T. Served as Chairman of Entertainment Committee for annual convention (1946).

MISS CECELIA KORTEUM,
Chicago, Illinois.
Member of A.S.M.T. since 1936.
President of Chicago S.M.T. (1938-40), served two terms on Executive Board, Executive Secretary (1946). Served as Section Chairman of the Medical Technology Division of the 1947 Tri-State Hospital Assembly.
Served as Chairman of Local Arrangements Committee for A.S.M.T. annual convention (1944). Served on editorial staff of A.J.M.T. (1943-46). Chairman of Technical Exhibits for 1947.
Member of American Nurses' Association and of Illinois Society of Bacteriologists.
Presented paper before annual convention of A.S.M.T. (1940), "Red Blood Cell Counts Photoelectric - Haemacytometer with Correction Factors for Abnormal Cells," published in A.J.M.T., Sept., 1940, Vol. 6, No. 5; "Camera Lucida Method of Direct Haemacytometry with the New Hemo-Protractor," published in the A.J.M.T., Nov. 1940, Vol. 6, No. 6. Presented papers before annual convention (1942), one, "Modernizing Color and Volume Index," published in A.J.M.T., Jan., 1943, Vol. 9, No. 1, and "Laboratory Economy," published in A.J.M.T., May, 1943, Vol. 9, No. 3.

Advisory Board (one to be elected)

SISTER M. ANTONIA KLAPHEKE, Lexington, Kentucky.
Member of A.S.M.T. since 1936.
President of Central Kentucky S.M.T. three terms. Chairman of Program Committee three terms.
Presented a paper and exhibits at state meetings of Catholic Hospital Association.
Presented paper at annual convention of A.S.M.T. (1941), "A Successful Blood Bank in a Non-Teaching Hospital," published in A.J.M.T., Jan. 1942, Vol. 8, No. 1.

MRS. CLARA T. KRUSE,
Oakland, Iowa.
Member of A.S.M.T. since 1943.
President of Indiana S.M.T. and held Seminar at University of Indiana Medical School (1942).
Chairman of Nominating Committee of A.S.M.T. (1945-46).
Member-at-large of the Advisory Committee to the Registry of M.T. (A.S.C.P.), 1943-44.
Member of American Association of University Women.

REPORT FROM THE EDUCATION COMMITTEE

Mention was made in the January Journal that the Hematology Loan Sets were nearing completion. This work has been halted temporarily because of our inability to purchase cover slips. We are waiting for more good smears showing typical cells of the various blood dyscrasias. Please make and send us about fifty smears from interesting cases coming to your attention (together with some history of the case). Both bacteriological smears and fungus demonstrations are also needed.

We especially would like to have materials of tissue parasites. Parasitized material may be sent us in block form or in formalin (10%). We are trying in this way to build loan sets for individuals wishing to review material which is not commonly available to them.

Glass slides and cover slips (when available) will be replaced or paid for by the A.S.M.T.

Rachel Lehman, Chairman,
Education Committee
3939 N. Capitol
Indianapolis, Indiana.

THE BOARD OF DIRECTORS VOTES

The Board of Directors voted that the President of the A.S.M.T. appoint a committee composed of three members, including the Executive Secretary, and two others from the Board, to pass upon all expenditures from the $900 committee fund as set up in the budget. This committee, made up of Mrs. Lucille Wallace, Miss Loretta Laughlin, and Miss Hermine Tate, has agreed that a sum of money, not to exceed $25, be allowed for travel expenses for a Counsellor who visits a group for the purpose of organizing a society of medical technologists. The suggestion is made that the local groups take care of hotel and other expenses.

The Board authorized the printing and mailing of 500 reprints of the article by Miss Rachel Lehman, entitled, "Preparation and Presentation of Teaching Material for Clinical Laboratory Demonstration," so that the same could be sent to each "approved" training school for medical technologists.

An amendment to the vote on convention awards for exhibits was passed to the effect that rather than the previous sums allowed for a first and second award, that two first awards of $35 each be made for the best scientific exhibits by 1, an individual, and 2, by a state group.

The Board voted that there be a convention registration fee of $1.00 for all members of the A.S.M.T., all registered M.T.'s (ASCP), and other guests, except physicians and students of medical technology, for whom there will be no charge.

STATE AND LOCAL SOCIETIES
MINNESOTA SOCIETY OF MEDICAL TECHNOLOGISTS

The Minnesota Society of Medical Technologists was organized on May 14, 1937, in Rochester, Minnesota. It was incorporated according to the state laws of Minnesota on November 15, 1939, and was affiliated with the American Society of Medical Technologists the following year. The organizational meeting was the culmination of some eight months of contacting medical technologists, pathologists, and institutions employing medical technologists, following the inspiration of Miss Frieda Claussen who had just been elected president of the national society at the fourth annual convention.

On May 14, 1937, some one hundred medical technologists and their guests, who included Dr. A. H. Sanford, Director of the Clinical Laboratories of the Mayo Clinic; Dr. Kano Ikeda, charter member of the Board of Registry of Medical Technologists (ASCP); Dr. W. A. O'Brien, Director of the School of Medical Technology, University of Minnesota, and Dr. A. E. Osterbert, Professor of Research Chemistry at Mayo Clinic, assembled at the Kahler Hotel, Rochester, for their preliminary meeting. The business and scientific sessions which followed were held in Plummer Hall of the Mayo Clinic. The committees reported the results of their work, and officers for the new organization were elected. Mr. Chauncey Winbigler, president, and Miss Edith Damgaard, recording secretary, were the first officers. Dr. Walter Boothby, authority on basal metabolism, and Dr. Frank J. Hack, hematologist, read papers at the scientific program, which was followed by a trip to the Institute of Experimental Medicine affiliated with the Mayo Clinic.

The Minnesota Society of Medical Technologists and many of its members have contributed much to medical technology. The organization has taken a progressive trend from the impetus that came as its inheritance from the state. Featured in this are a number of "firsts" in medical technology:

1. Minnesota was the state in which the Board of Registry of Medical Technologists (ASCP) was organized (Minneapolis, 1928).

2. It is the only state which still has a charter member on that Board.

3. It was the first state to inaugurate a college course in medical technology (University of Minnesota, 1923). This school is at present the largest of its kind in the world.

4. It is the only state that has all its approved schools for training medical technologists (seven) on the collegiate basis leading to a bachelor's degree in Medical Technology or to a bachelor's degree with a major in Medical Technology.

5. Minnesota was one of the first states in which a society of medical technologists was organized (Twin-City Society of Medical Technologists, 1924) to function for their professional good.

6. Minnesota was one of the first societies to organize functioning district groups of which there are now five, the Crookston District having been organized in the spring of 1946.

7. Minnesota was the first state society to have its own publication, The Minnesota Medical Technologist, and to have bulletins from most of its constituent organizations. Miss Barbara Tucker, Minneapolis, is editor of the state publication.

In the spring of 1946, 214 medical technologists out of a possible 220* were members of the state society. In January, 1947, Minnesota had 134 members of the ASMT.

Officers of District Societies:

District No. 1—Miss Patricia Bolger, Fargo Clinic, Fargo, N. D. (Business address), President.
Sr. M. Digna, OSB, St. Vincent's Hospital, Crookston, Minn, Sec'y.-Treas.

District No. 2—Miss Edith Damgaard, Duluth Clinic, Duluth, Minn., President.
Miss Florence Duggan, Medical Arts Bldg., Duluth, President-Elect.
Miss Dorothy Rauschenfels, St. Mary's Hospital, Duluth, Secretary.
Miss Elizabeth Hudberg, St. Mary's Hospital, Duluth, Treasurer.
Miss Jane Maghan, St. Luke's Hospital, Duluth, Vice President.
Miss Marion Polasky, 315 N. 65th Ave., W., Duluth, Board Member.
Sr. M. Alcuin, OSB, College of St. Scholastica, Board Member and Editor of the "Arrow."

District 3.—Miss June Tyson, St. Joseph's Hospital, Brainerd, President.
Sr. M. Helen, OSF, Breckenridge, Minn., Vice President.
Mrs. Agatha Caylor, Litchfield, Minn., President-Elect.
Sr. M. Michael, OSB, St. Cloud, Minn., Sec'y.-Treas.
Sr. M. Emerita, OSF, Little Falls, Minn., Board Member.
Miss Sylvia Finsand, Glenwood, Minn., Board Member.

District 4—Mrs. Eileen Smith, Minneapolis, President.
Miss Thelma Erickson, St. Paul., President-Elect.
Miss Eleanor Egelston, Minneapolis, Secretary.
Miss Stella Rossness, Twin-Cities, Treasurer.
Miss Ruth Hovde, Minneapolis, Vice President.
Miss Dorothy Magaw, St. Paul, Board Member.
Miss Frieda Claussen, St. Paul, Board Members.
Miss Loretta Laughlin, Minneapolis, Board Member.
Miss Geraldine Faltesek, Minneapolis, Editor of the "Lens."

District 5—Mrs. Vivian Wolff, New Ulm, Minn., President.
Miss Esther Wilbrecht, New Ulm, Minn., President-Elect.
Mrs. Jane Prevey, Mankato, Secretary-Treasurer.
Miss Elizabeth Maclay, Mayo Clinic, Rochester, Board Member.
Sr. Amalia Klopsteg, Faribault, Board Member.
Mr. Audrey Lewis, Mankato, Editor of the "Key."

* Later figures not available.

ANNUAL CONVENTION OF CANADIAN SOCIETY OF MEDICAL TECHNOLOGISTS

The convention of the Canadian Society of Laboratory Technologists to be held in May, 1947, will be the 10th anniversary of the incorporation of the C.S.L.T. under Dominion Charter in 1937. It will be held at the Royal Connaught Hotel, Hamilton, Ontario, on May 29th, 30th and 31st, 1947. Guests (non-members) will be welcome at all but the business sessions. Papers and scientific movies on various aspects of laboratory technique will be presented. For further information, write to Miss Helen L. Smith, Secretary, Canadian Society of Laboratory Technologists, 294, Street, East, Hamilton, Ontario.

CALIFORNIA SOCIETY OF MEDICAL TECHNOLOGISTS

The newly-formed California Society of Medical Technologists is inviting all members of the A.S.M.T., and all other registered MTs (ASCP) in the state, to attend the organizational meeting to be held May 2 and 3, 1947, in Los Angeles. Details of the plans will be announced later. Several excellent speakers will be featured.

If you are a registered MT (ASCP) in the state of California and you have not already received information about this new organization, and your membership blank, contact Miss Jeanne Jorgenson, 900 Modoc Street, Berkeley 7, California, or Mrs. Genevieve Walters, 1204 Ozone, Santa Monica, California.

EDUCATIONAL COMMITTEE

Technologists interested in a course in parasitology that is offered at the Atlanta Public Health School contact Rachel Lehman, 3939 N. Capitol, Indianapolis, Ind. Application blanks are available for this course. This work lasts six weeks and is based on the diagnosis from the laboratory angle. National authorities in various parasitological fields will teach.

There will be no tuition and no expense for books.

For all technologists who cannot get away to come to the school, the Atlanta Institution is preparing loan sets. All persons interested in these loan sets please send in requisition to the Education Committee chairman of the ASMT.

WISCONSIN SOCIETY OF MEDICAL TECHNOLOGISTS

Madison Society of Medical Technologists—Officers:

President—Lola Kraemer, 306 E. Sunset Court.
Vice President—Mary Was, 919 Emerald St.
Secretary—Nancy F. Harper, 2117 Kendall Ave.
Treasurer—Shirley Finucane, 1010 Mound St.
Program Chairman—Mary Lounsburg, 109 W. Wilson St.

Milwaukee Society of Medical Technologists—Officers:

President—Margaret Foley, 2039 W. State St.
Vice President—Winifred Lutsey, Columbia Hospital.
Secretary—Caroline Retelsdorf, 2522 N. Lake Drive
Treasurer—Mary Jane Budjien, 1418 North St. Waukesha.

It is suggested that copies of the proposed revision of the Articles of Incorporation and By-Laws be in the hands of secretaries of state societies at the annual business sessions and that matters therein be open for general discussion. Member elected to sit in the House of Delegates on July 1, 1947, are requested to bring their copies of this Journal with them for reference at that meeting.

The New Hampshire Society of Medical Technologists has applied for affiliation and the Michigan Society of Medical Technologists has received their charter from the American Society of Medical Technologists.

ANNUAL CONVENTIONS—STATE

California Society of Medical Technologists—Los Angeles, May 2 and 3, 1947

Minnesota Society of Medical Technologists—about May 17, 1947

New Hampshire Society of Medical Technologists—Portsmouth, June 19 and 20, 1947

Oklahoma Society of Medican Technologists—May 3 and 4, 1947

Texas Society of Medical Technologists—Houston, April 11 and 12, 1947

Wisconsin Association of Medical Technologists—May 8 or 9, 1947.

TO STATE ORGANIZATIONS: Please notify the A.J.M.T. of your convention dates and cities. Be sure to request your copies of the "Information Pamphlet" and application blanks for membership from the Executive Office so that you will have an ample supply on hand for prospective members who attend your meetings.

APPLICATION FOR HOTEL RESERVATION
AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS
Annual Convention, June 30, July 1, 2, 1947
Denver, Colorado

Please make hotel reservations noted below, and mail to Chairman of Local Arrangements Committee: Miss Elizabeth O'Toole, 1345 Elati St., Denver 4, Colorado.

The Shirley-Savoy is headquarters hotel. However, it will not be possible to house all delegates at this hotel. The other two hotels listed are located but one block from headquarters. Because of shortage of hotel rooms, there will be only a limited number of single rooms available, and we can therefore, assure delegates of better accommodations if they will arrange to share rooms, or be willing to be assigned a roommate by our housing bureau. Will one occupant of a room please make out this form and indicate name and address of other occupant(s).

If, after your reservation has been made, you find that you will be unable to attend the convention, please be sure to cancel your reservation directly with the hotel.

	Double Room (Twin Beds)	Double Room (Double Bed)	Accommodations 3 or 4 Persons to a Room or Suite
***Brown Palace Hotel—17th and Tremont	$6.60 to $8.80	$6.60 to $8.80	$ 8.80 to $17.20
***Cosmopolitan Hotel—18th Ave. & Broadway	$6.60 to $8.80	$6.60 to $8.80	$11.00 to $18.00
***Shirley Savoy—17th Ave. & Broadway	$3.50 to $4.50	$2.50 to $3.50	$ 6.00 to $ 8.00

Tear Off and Mail to
MISS ELIZABETH O'TOOLE
1345 Elati St.
Denver, Colorado

Number of rooms_____ at the _____ Hotel, to be occupied by:

Name	Street Address	City	State

Type of accommodations _____

Would prefer a rate of $_____ to $_____, per person.

Date of Arrival _____ A.M. _____ P.M. _____

Date of Departure _____ A.M. _____ P.M. _____

Signed _____

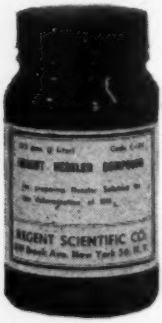
Address _____

City and State _____

***Rates quoted are those in effect Feb. 10, 1947. These are subject to change without notice, according to OPA regulations now pending.

Regent Laboratory Specialties

NESSLER COMPOUND



No Alkaline Solution Necessary

A dry, stable, granular compound, delicately and accurately adjusted, to make a perfect Nessler Solution of the correct alkalinity (8.5 p.c. NaOH).

Simply Dissolve In Water!

C-101 1 bottle (155 gm).....$2.40
Makes one liter of solution.

BENEDICT COMPOUNDS

Save Time . . . Space . . . Labor!
Dry Granules
Simply Dissolve in Water

Qualitative

C-102—1 box (liter size).....$ .45
Lot of 12 boxes.....$ 5.00
C-103—1 box (gal. size).....$ 1.35
Lot of 12 boxes.....$15.00

Quantitative

C-104—1 pkg. (liter size).....$ .90
Lot of 12 pkgs.....$10.00
C-105—1 pkg. (gal. size).....$ 2.70
Lot of 12 pkgs.....$30.00
Note: Each Quantitative package has two containers to make the necessary solution.

ALL PRICES ARE F.O.B., NEW YORK, N. Y.

REGENT SCIENTIFIC COMPANY

919 Brook Avenue **New York 56, N. Y.**

Western Positions

Laboratory Technician—For fast-growing group owning small private general hospital, Southern California desert; work involves all procedures; $250, meals.

Laboratory Technician—To work under direction of well-known pathologist in 75-bed general hospital, small town in Southern California near Los Angeles; $250, maintenance.

Laboratory Technician—Tuberculosis hospital, 150 beds, foothills of High Sierras, California; $225.

Laboratory Technician—Large private general hospital, Southern California, Los Angeles area; several technicians on staff, excellent pathologist in charge; $235, no overtime no call.

Laboratory Technicians — Hospitals and clinics, Texas; salaries from $200-$250.

Laboratory Technician—Doctor with well-established practice, small town near Los Angeles, needs capable technician; salary and commission, room available at a reasonable rate.

Laboratory and X-Ray Technician—Capable of taking entire charge under visiting pathologist, relieve in x-ray; small private general hospital northeast of Los Angeles; $300, meals; every week-end off; no call.

Laboratory and X-Ray Technician — All laboratory procedures except tissues; diagnostic x-ray only; scenic location, State of Washington.

Laboratory and X-Ray Technician—Combine both departments, doctor's office in Idaho; salary open.

X-Ray Technician — Clinic and hospital, Southern California desert near Mexican border; active small town, progressive group; $250, meals.

X-Ray Technician — Registered, for five-man group; famed location, southern New Mexico.

Business and Medical Registry

(AGENCY)
ELSIE MILLER, Director
609 SOUTH GRAND AVENUE, LOS ANGELES 14, CALIFORNIA

PREFACE TO PROPOSED REVISIONS

ATTENTION, ALL MEMBERS:

The committee that was appointed last fall to study any and all suggestions for the revision of our Articles of Incorporation and By-Laws, respectfully submit for your consideration, certain recommendations that follow. The committee considered these changes long and carefully and with diffidence, but finally felt assured that they will help meet the problems of tomorrow which will be vastly different than the problems of the past. The House of Delegates, whose privilege it is to accept or reject these changes, has no barriers for the free exchange of ideas. It is the hope of this committee, however, that all members will take time NOW to study the proposed changes and that the affiliated Societies will be explicit in their instructions to Delegates so that the Denver meeting can be concluded with dispatch.

The committee desires to thank every individual who participated in this study.

MEMBERS ATTENDING THE MEETING OF THE HOUSE OF DELEGATES ARE REQUESTED TO BRING WITH THEM THIS COPY OF THE PROPOSED REVISIONS OF THE ARTICLES OF INCORPORATION AND BY-LAWS.

CERTIFICATE OF AMENDMENT TO ARTICLES OF INCORPORATION

AMERICAN SOCIETY OF MEDICAL TECHNOLOGISTS
A MICHIGAN CORPORATION

(NON-PROFIT)

ARTICLE I.

Name

The name of this corporation is International Association of Medical Technologists.

ARTICLE II.

Purposes

The purposes of this corporation are:

To promote higher standards in clinical laboratory methods and research.

To elevate the status of those specializing in medical laboratory technique.

To create mutual understanding and cooperation between the medical technologist and physicians and all others who are employed in the interest of individual or public health.

To issue charters to subordinate associations or chapters of this Association.

To promote the mutual aid and benefit of its members.

In general to do anything and everything necessary and proper to the conduct of an association of this nature, and for the purpose of attaining or furthering any of its objectives to do any and all other acts and things, and to exercise any and all other powers which now or hereafter may be authorized by law.

ARTICLE III.

Location

The location of the corporation is the City of Detroit, in the County of Wayne, State of Michigan, Post Office address of registered office in Michigan is 1100 Dime Building, Detroit 26, Michigan.

ARTICLE IV.

Plan

Said corporation is organized upon a non-stock basis.

Said corporation is to be financed under the following general plan: Annual Dues.

ARTICLE V.

Incorporators

The names and places of residence, or business, of each of the original incorporators were as follows:

John H. Conlin, 10439 Outer Drive East, Detroit, Michigan
Christine Clayton Sequin, 8056 Lincoln Avenue, Niles Center, Illinois
Robert C. Jenkins, 948 Edgecomb Place, Chicago, Illinois.

ARTICLE VI.

First Board of Directors

The names and addresses of the first board of directors (or trustees) were as follows:

Sarah McCarty, 805 Medical Arts Bldg., Birmingham, Alabama
Robert Jenkins, 948 Edgecomb Place, Chicago, Illinois
John H. Conlin, 10439 Outer Drive East, Detroit, Michigan.

ARTICLE VII.

Term of Corporation

The term of this corporation is perpetual, subject to the right of the Legislature to amend Section 12, Act 327, Public Acts, 1931.

ARTICLE VIII.

Membership

Section 1. The membership of this Association shall consist of two general classes:

(a) Active members who shall be members in good standing of a subordinate Medical Technologists' Association of a state, or District of Columbia, or territory of the United States or of a foreign nation and which Association holds a charter from this Association and is itself in good standing. All members of this Association who do not become a member of such a subordinate Association of the place of their residence within one year after the adoption of the amendment of these Articles of Incorporation shall forfeit their membership in this Association. Only persons who are of good moral character and either (1) hold a certificate from and are in good standing with the Board of Registry of the American Society of Clinical Pathologists or (2) possess an academic degree from an accredited college at a baccalaureate level in Medical Technology or a baccalaureate degree in arts or science with a major in Medical Technology or possess a degree at a master's level from an accredited college in any one of the six major fields of Medical Technology, viz: biochemistry, bacteriology, parasitology, histology, hematology, and serology and have one year's experience in a clinical laboratory approved by any member of the American Society of Clinical Pathologists shall be eligible to be active members. Only active members shall be eligible to participate in any affairs of this Association.

(b) Honorary members as provided by the By-Laws of this Association.

Section 2. The qualification, admission, retention or dismissal of members shall be governed by the By-Laws of this Association.

ARTICLE IX.

Officers, Directors, Advisory Council

Section 1. The officers of this Association shall be: President, President-Elect, Recording Secretary, Executive Secretary, and Treasurer; with duties as assigned to them in the By-Laws of this Association.

Section 2. The Board of Directors of this Association shall consist of the President, immediate Past President, President-Elect, Recording Secretary and Treasurer, during their term of office, and six members of the Association elected by the House of Delegates. It shall constitute the governing body when the House of Delegates is not in session.

Section 3. The Advisory Council shall be composed of the Board of Directors of this Association, the President of each subordinate Association, and the Editor of THE AMERICAN JOURNAL OF MEDICAL TECHNOLOGY. The duties of the Advisory Council shall be to consider and to promote the interests of this Association.

Section 4. The By-Laws shall provide for the election, duties and term of office of all officers, boards and committees.

ARTICLE X.

House of Delegates

Section 1. There shall be a House of Delegates whose membership shall consist of:

(a) The President, immediate Past President, President-Elect, Recording Secretary, Treasurer, Executive Secretary, the members of the Board of Directors, and the members of the Advisory Council or their alternate for such member.

(b) The subordinate State, Territory or foreign nation Delegates chosen on a representative basis as hereinafter provided for in the By-Laws.

Section 2. The duties of the House of Delegates shall be those of the governing body of this Association.

ARTICLE XI.

Subordinate Associations

Section 1. This Association shall be composed of subordinate Associations which shall be one to each geographically defined state, District of Columbia, territory, possession, or dependency of the

U. S. A. and of a foreign nation.

Section 2. All Associations of a State, Territory, possession or dependency of the U. S. A. or of a foreign nation which are now affiliated with or a part of this Association shall be the duly recognized subordinate Association of such geographical division. Subordinate Associations may be formed in other geographical divisions by three or more persons eligible for membership who shall make application on a form prepared by the Association and which forms shall be accompanied by a Charter fee of $5.00 submitted through the office of the Executive Secretary to the membership committee of this Association. Approval by a majority of the Board of Directors shall be necessary for acceptance of such application.

Section 3. Each subordinate Association shall sustain its status with this Association by maintaining a Constitution and By-Laws in harmony with the Constitution and By-Laws of this Association; and upon payment of annual charter renewal fee of one dollar ($1.00) shall be issued a current date seal to be affixed to original charter.

Section 4. This Association shall be empowered to revoke the charter of any subordinate Association upon notice and an opportunity to be heard thereon, by a ⅔ vote of the Board of Directors (subject to an appeal to the following annual meeting of the House of Delegates whose decision shall be final) for

a. Following a policy contrary to the Code of Ethics of this Association.

b. For adopting rules or laws contrary to the purpose of this Association.

c. For failure to cooperate reasonably with this Association.

Section 5. Any subordinate Association whose charter has been revoked may be reinstated by ⅔ vote of the Board of Directors of this Association upon application, providing said Association is no longer in default and pays all expenses incurred including a Charter fee of five dollars ($5.00).

ARTICLE XII.

By-Laws

Section 1. By-Laws shall be adopted by the Association which may provide restrictions on the exercise of the corporate power of this Association in addition to those contained in the Articles; and, in general, may provide in detail for the government of the Association and of its members and include any provisions not inconsistent with the expressed provisions of these Articles.

Section 2. By-Laws of this Association may be amended, adopted or added as follows:

The proposal shall be submitted in writing to the Committee on Constitution and By-Laws who may make such changes as necessary to provide proper form without a change in the meaning thereof and shall vote upon said proposal. If such proposition is approved by said Committee, it shall be submitted to the Executive Secretary for

publication and if disapproved, it shall be submitted to the Board of Directors and if approved by a majority vote of said Board, it shall then be submitted to the Executive Secretary for publication. Publication of the proposal shall be made in the official organ at least sixty days prior to the next annual meeting of the House of Delegates and approval of said proposal by a majority vote of the votes cast in the House of Delegates shall be necessary for its adoption.

ARTICLE XIII.

Amendments—(Constitution)

Section 1. The Articles of Incorporation of this Association heretofore existing, not included in this amended certificate, are hereby in all things repealed. The present form of the Articles of Incorporation as amended shall be the Constitution of this Association.

Section 2. Amendments to these Articles shall be submitted in writing to the Committee on Constitution and By-Laws who shall submit the same to the Board of Directors with their opinion, and if such amendments are approved by a two-thirds vote of the Board of Directors, the Executive Secretary shall publish the same in the official organ at least sixty days prior to the next annual meeting of the House of Delegates. Amendments shall become effective only then upon approval by a majority vote of the votes cast in the House of Delegates and within one year after the recommendation of the Board of Directors.

BY-LAWS

of

INTERNATIONAL ASSOCIATION OF MEDICAL TECHNOLOGISTS

ARTICLE I.

Subordinate Associations

Section 1. Subordinate Associations shall be formed as specified in the Constitution of this Association after approval of its application as provided in Article XI. It shall, if unincorporated, submit its proposed Constitution and By-Laws and if proposed to be incorporated, its proposed Articles of Incorporation, Constitution and By-Laws to the Board of Directors of this Association for their approval. A list of all charter members and officers by name and address shall be similarly submitted. A Charter shall be issued to the subordinate Association after approval by a majority of the Board of Directors of the proposed Articles of Incorporation, Constitution, By-Laws and membership list.

Section 2. The name of each subordinate Association shall be (name of *state, territory or nation*) "Association of Medical Technologists."

Section 3. It shall be the duty of each subordinate Association to:

a. Send to the Secretary of this Association the names and addresses of all officers immediately after their election or appointment.
b. Submit all proposed amendments to the Constitution and By-Laws Committee of this Association sixty (60) days before the date the opinion of said Committee is desired.

c. Send to said Constitution and By-Laws Committee any revised Constitution or By-Laws one month after their ratification.

d. Send in duplicate to the Executive Secretary of this Association a typewritten classified list of names, Registry No. (ASCP) if registered, and addresses of all members with dues paid as provided for in Article III, Section 1 of these By-Laws.
e. Send to the Executive Secretary of this Association, fifteen (15) days prior to the opening of the annual convention, the names and addresses of those who are entitled to act as delegates to the House of Delegates.
f. Make provisions for transfer of membership as provided for in Article II, Section 3 of these By-Laws.
g. Make such report to the Board of Directors of this Association as may be required.

Section 4. Any subordinate Association may be suspended as a subordinate member of this Association for default in the requirements of these By-Laws, by a two-thirds vote of the Board of Directors, if upon thirty (30) days notice of such default, said Association fails to correct such default. A suspended State Association may be reinstated by a two-thirds vote of the Board of Directors.

Section 5. Each subordinate Association may organize its territory into district, regional, County or City Associations and provide for the government of such Associations, provided the same is in harmony with the Constitution and By-Laws of this Association.

ARTICLE II.

Membership

Section 1. Application for membership in a subordinate Association shall be upon a form prescribed by this Association and shall be submitted to the Secretary of such subordinate Association or to the Secretary of this local Association as may be determined by the subordinate Association. Each subordinate Association shall provide for the method of election of its membership and shall provide for the eligibility of members subject to the provisions of this Association.

Section 2. The presentation of a list of active members in good standing in the subordinate Association signed by the Secretary of said Association, together with the annual dues, shall establish such members as members of this Association.

Section 3. Any member who changes his residence to another state, territory or nation from that in which he is a member shall be

eligible to membership in the subordinate Association of his new residence for the remainder of the fiscal year without further payment of dues, provided he meets the requirements for membership in the new subordinate Association. The request for transfer of membership shall be made to the Secretary of the subordinate Association of which he is a member at the time of his change of residence.

Section 4. Honorary members shall be those who have distinguished themselves by research, or personal sacrifice in the cause of scientific investigation, and shall never exceed one per cent of the active membership. They shall enjoy all the privileges of the Association except office-holding and voting. Admission for honorary members shall be by recommendation of the Board of Directors and the unanimous vote of those voting at the annual meeting. Honorary members shall be notified of their election by the Executive Secretary who shall also forward an engrossed certificate of their elections signed by the President and Recording Secretary.

Section 5. Any member who violates any code of ethics prescribed by this Association or a subordinate Association or whose conduct is detrimental to such an Association may be expelled from a subordinate Association by a two-thirds vote of its Board of Directors after a hearing of the charges against him, provided said member has been given ten days' notice by registered mail of the charges filed against him and of the time and place where such hearing will be held. Such charges shall be in writing and submitted to either the Board of Directors of this Association or the subordinate association provided the Board of Directors of this Association shall refer the charges to the proper subordinate Association. An expelled member may be reinstated upon application and the approval of two-thirds of the Board of Directors of the Association which expelled him.

ARTICLE III.

Dues

Section 1. The annual dues for active members shall be in such sum as each subordinate Association shall prescribe, of which sum $5.00 per annum shall be paid to the Treasurer of this Association. Annual dues shall be payable on or before September 15th and that portion due this Association shall be transmitted by the subordinate Association Treasurer on or before September 15th and be accompanied by a typewritten list of payees, listing their names, addresses and Registry numbers, if registered. Dues paid after September 15th shall be similarly transmitted the following fifteenth of the month.

Section 2. Any active member who fails to pay annual dues by November 15th shall be suspended from membership and may be reinstated upon payment of all dues in arrears, current annual dues and the sum of $1.00 as a reinstatement fee to be paid to this Association. Any member who ceases to be actively engaged as a medical technologist shall be reinstated upon payment of current annual dues and the reinstatement fee. The Secretary of the subordinate Association shall notify each suspended member and the Executive Secretary of this Association of such suspension.

Section 3. Applicants elected to active membership after January 1st shall pay half the annual dues for the remainder of the fiscal year.

Section 4. No dues shall be charged honorary members.

ARTICLE IV.

Code of Ethics

This Association may adopt a code of professional ethics which shall govern the professional conduct of the active members. Such code shall become effective upon adoption by a majority vote of the votes cast in the House of Delegates. Such code shall have the force and effect of a By-Law and shall be amended in the same manner as a By-Law.

ARTICLE V.

Term of Office—Officers

Section 1. Only active members who have been in this Association at least two (2) years and who are in good standing are eligible to hold office, or be on the Board of Directors. Any person who ceases to be an active member shall forfeit any office held in any Association.

Section 2. All officers shall be elected annually by the House of Delegates at the convention, with the exception of the Board of Directors, who shall be elected for a period of three years; two being elected at each annual meeting of the House of Delegates to succeed the two having served three years; and the Treasurer, who shall be elected every three years to serve for three years. The official list of candidates for each office shall first be presented at the annual election and additional nominations for each position may then be made from the convention floor. Balloting shall be by written ballot and if no candidate receives a majority of all votes cast, then the person with the lowest number of votes be eliminated and balloting be continued in like manner until a candidate receives a majority of the vote. Tie shall be determined by lot.

Section 3. The term of office of each newly elected or appointed officer except those filling vacancies shall commence with the adjournment of the meeting at which he was elected, and shall continue for the term for which he is elected or appointed, or until his successor has been elected and qualified.

Section 4. Vacancies occurring in offices filled by election by the House of Delegates, shall be filled unless otherwise provided for, to the close of the fiscal year in progress, by election by the Board of Directors; and, any portion of the vacant term remaining after the end of the fiscal year shall be filled by an election of the House of Delegates at its next annual meeting.

Section 5. No officer may succeed himself in office except the Recording Secretary and Treasurer, each of whom may serve a second term. No officer shall hold more than one office during any one term, except as may be provided for in these By-Laws.

Section 6. Any motion for the expulsion of any officer of this Association shall be submitted first in confidence (without further divulging the name of the officer) to the President of the Association

with a full statement of the *prima facie* evidence on which the motion is based. The President in conjunction with the two ex-Presidents preceding him most immediately in office shall form a committee with full power to decide whether the motion shall be dropped without further action and without report to the Board of Directors; whether the accused officer shall be allowed to resign without report to the Board of Directors; or whether the motion shall be referred to the Board of Directors. If the motion is referred to the Board of Directors, a unanimous vote of the Board of Directors shall be required to make it final. If by the action of the Board of Directors a vacancy be created in any office, it shall be taken care of as any other such vacancy.

Section 7. At the end of his term of office by expiration or otherwise, each officer except Treasurer, each Board Member and Council Member shall deliver his official records and correspondence to the Executive Secretary who shall preserve the same, subject to the direction of the Board of Directors.

Section 8. The **President** shall be the chief executive of this Association and shall preside at meetings of the Board of Directors, House of Delegates, and the Advisory Council; be ex officio member of all standing and special committees; appoint, unless otherwise specified, all standing committees immediately or within one month of his incumbency; and appoint, such special committees as he shall deem necessary provided the Board of Directors approves.

The President-Elect automatically succeeds to the Presidency at the adjournment of the annual meeting next following the annual meeting at which he was elected, or following the expiration of a *Status Quo* on officers, otherwise the House of Delegates shall elect the President.

Section 9. The **President-Elect** shall perform the duties usually performed by a Vice-President. He shall fill the vacancy in the case of the President's absence, disability, or death. If such vacancy occurs less than five months before the end of the President's term, the President-Elect shall, after filling such vacancy, continue as President for the succeeding full term. In the event that there is a vacancy in the office of President-Elect, the Board of Directors shall elect by majority vote a President-Elect from the nominees of the previous election for that office.

Section 10. The **Recording Secretary** shall act as Secretary at all meetings of the Board of Directors, House of Delegates, Advisory Council, and this Association; and shall prepare, have approved by the presiding officer and file with the Executive Secretary the minutes of all such meetings. He shall have the services of an expert stenographer (in the convention city) to make a stenographic report of the business meetings of the House of Delegates; and shall carry on such correspondence pertaining to the Association as shall be delegated him by the Board of Directors.

In the event of the absence or disability of both the President and President-Elect, he shall act as President, and in the event of a vacancy in both such offices, he shall succeed to the office of president to fill the unexpired term of office.

Section 11. The **Treasurer** shall collect, receive, accurately record, and have charge of all funds of this Association; shall deposit

such funds in a bank designated by the Board of Directors, and pay all bills approved by the Board of Directors upon receipt of voucher signed by the Chairman of said Board; have accounts audited at the Association's expense by a public accountant the month previous to the annual meeting and the report shall be submitted to the House of Delegates at the annual meeting; and, shall report the financial condition of the Association to the President and Board of Directors whenever requested. He shall, if the Board of Directors advise, be bonded at the Association's expense. He shall deliver his current records following the last audited report, and all cash on hand to his successor, and all other records of every kind to the Executive Secretary.

Section 12. The **Executive Secretary** shall be elected by the Board of Directors and shall serve during the pleasure of said Board. He shall, under the direction and control of the House of Delegates and Board of Directors, maintain a central office for the Association in which the records, properties, bonds, and legal papers of this Association shall be preserved in properly maintained files. He shall under the direction of the Board of Directors perform the administrative work necessary to the proper operation of the Association, and shall be the business manager of the official Journal.

ARTICLE VI.

House of Delegates

Section 1. Each subordinate Association shall have the privilege of electing or appointing in a manner said association shall determine, one delegate to the House of Delegates for every 25 members or fraction thereof, computed on the basis of the number of members in good standing in the subordinate Association, fifteen (15) days before the opening day of the annual convention, as evidenced by the dues posted or paid to this Association at that date. No subordinate Association shall have less than one or more than 10 delegates.

Section 2. A delegate may be represented by an alternate selected in such manner as the subordinate Association shall determine.

Section 3. In lieu of absenteeism among delegates and alternates, the President of this Association may fill the quota of delegates for a subordinate Association by appointees from the active members in good standing attending the convention from said Association.

Section 4. The Secretary of each subordinate Association shall send a list of its accredited delegates and alternates, their addresses and Registry No. (ASCP), if registered, to the Executive Secretary of this Association at least 15 days prior to the opening day of the annual convention.

Section 5. All delegates to the meeting shall present their credentials at the time of registration to the Reception Credentials and Registration Committee who shall determine the properly accredited delegates in the event of any contest.

Section 6. Each delegate or alternate shall serve a term of one year and until his successor shall have been duly elected and certified. Votes shall be cast only in person.

Section 7. Any member of the Association not an accredited delegate but in good standing shall be eligible to attend the House of Delegates meeting as a visitor.

ARTICLE VII.

Board of Directors

Section 1. The **Board of Directors** shall be vested with the charge of all properties and funds and the control and management of the affairs of this Association, and shall have power and authority to do and perform all acts and functions not inconsistent with the Constitution and By-Laws or with any action taken by the House of Delegates of this Association.

Section 2. The Board of Directors shall designate which officers are to be remunerated and the amount of such remuneration and shall refund necessary expenses incurred by officers and members of committees in the service of this Association.

Section 3. Between the regular and special meetings of the Board of Directors, the usual method of carrying on business shall be by mail or telegraph, if, in the opinion of the President, definite questions relating to the affairs of the Association require immediate action. The President, or any member of the Board, shall submit the matter for action in the form of written motion to the Executive Secretary, and by him it shall be submitted to the members of the Board requesting that they vote thereon.

The result of such referenda shall control the action of this Association and its respective members. The Board shall make a report to the House of Delegates of this Association annually of the business transacted in the interest of the Association.

Section 4. The Board of Directors shall make provisions for the execution of the business, scientific and educational programs contingent to the annual convention of this Association.

Section 5. Annual meetings of the Board of Directors shall be held at the annual meeting of the House of Delegates. Special meetings may be called by the President or by a majority of the Board. A majority vote of all the Directors shall be necessary for the transaction of any business.

ARTICLE VIII.

Advisory Council

Section 1. The Advisory Council shall promote the work of this Association suggesting a program of activities on matters of administrative, legislative, professional, educational, public relations, government relations, and such other interests as promote the growth of this Association; and shall possess powers and duties not inconsistent with these By-Laws as may be determined by the Board of Directors.

Section 2. Subcouncils, constituted of members of the Advisory Council appointed by the Chairman of the Advisory Council, may be

created or dissolved as deemed advisable by the President and sanctioned by a majority vote of the Members of the Advisory Council.

Section 3. On a date specified by the Board of Directors, the Council shall prepare and submit to the Board of Directors a written report of its activities and recommendations. No report, recommendation, or other action of the Advisory Council shall be considered as the action of this Association until the same has been approved by the Board of Directors and submitted to the House of Delegates while in session.

Section 4. The usual method of carrying on business by the Advisory Council shall be by mail or telegraph between regular or special meetings providing the matter is imperative and the President or thirty (30) members of the Advisory Council have submitted the matter for action and acted in accord thereafter as set down in Article VII, Section 3 of these By-Laws.

ARTICLE IX.

Standing Committees

Section 1. There shall be eight (8) standing committees of six (6) members each of such geographical distribution as shall be conducive to effective action. These committees shall be the following: Membership, Constitution and By-Laws, Nominations and Elections, Standards and Studies, Research, Service Fund and Finance, Legislation, and Education.

Section 2. Immediately or within thirty (30) days following the annual meeting at which these By-Laws are adopted the President shall appoint six members of this Association for each Committee, two to serve one year, two to serve two years, and two to serve three years. Each year thereafter two members of each committee shall be appointed by the President to succeed those having served three years.

Section 3. The term of office of members of standing committees extant at the time of adoption of these By-Laws shall be adjusted by the Board of Directors to comply with this Article.

Section 4. The Membership Committee shall devise ways and means of cooperation with the membership committees of the subordinate Associations in helping them secure membership.

Section 5. The Constitution and By-Laws Committee shall examine all proposed amendments to the Constitution and By-Laws of this Association and shall submit them in proper form to the Executive Secretary for publication and shall make such changes in such proposed amendments or by-laws as shall be necessary to put them in proper form without effecting any change in meaning. It shall examine all proposed by-laws and constitutions submitted by a subordinate Association and all amendments thereto and shall submit the same with an opinion to the Board of Directors. It shall examine all proposed amendments to the Constitution and By-Laws of a subordinate Association to determine whether the same are in harmony with this Association.

Section 6. The **Nominations and Elections Committee** shall pub-

lish in the November Journal the names of all officers and directors whose term of office expires with the close of that fiscal year and shall request names of proposed candidates for such offices. It shall select two candidates for each office and for each term expiring on the Board of Directors and this list shall be published in the pre-convention issue of the official organ, provided no persons shall be listed unless they have consented to serve if elected. The Committee on Nominations and Elections shall conduct all elections at the annual meeting of the House of Delegates. Nominations for office may be made from the convention floor.

Section 7. The **Standards and Studies Committee** shall undertake the study of medical technology ethics, economics, and kindred problems; inform medical technologists about the activities of the professional medical technology organizations so that greater participation and support will be rendered and shall promote better understanding of professional medical technologists by the public so that the public will discriminate between inadequately and soundly prepared medical technologists.

Section 8. The **Research Committee** shall direct research activities of the Association.

Section 9. The **Service Fund and Finance Committee** shall stimulate Fund raising for service to the medical technologist, graduate and undergraduate; and shall comply as far as possible with the suggestions of the Board of Directors about formulating policies and maintaining practices relative to the use of the Fund. The Treasurer shall sit on the Committee and be custodian of the Fund. Disbursements from the fund shall be made by voucher signed by the Chairman of the Board of Directors. A separate financial account shall be kept for the Fund and audited as provided for other financial accounts, which auditor's report shall be submitted to the House of Delegates at its annual meeting. This Committee shall study also ways and means of meeting allotments established in the budget, and, shall prepare said budget for the following fiscal year to be presented at the annual meeting of this Association.

Section 10. The **Legislation Committee** shall assume such duties as shall be assigned to it by the Board of Directors.

Section 11. The **Education Committee,** which shall be replaced by an "American Board of Medical Technology" immediately upon the inception of such a Board, shall give thought and attention to schools, libraries, curricula, and students, graduate and undergraduate in medical technology; and shall aid the Registry of Medical Technologists of the ASCP in such capacities as the Registry shall indicate.

Section 12. The President shall appoint the necessary personnel for committees at the annual convention as follows: **Program** which shall arrange for the scientific program; **Exhibits** which shall solicit the scientific and commercial exhibits and aid the exhibitors in the transfer and display of such exhibits; **Awards** which shall arrange for the evaluation of entries, and presentation of Awards for the scientific productions; and, such other committees as **Local Arrangements, Reception Credentials and Registration, Publicity, Entertainment, and Sisters' Hospitality** Committees.

Section 13. Additional committees may be appointed at any time

by the President, on authority given him by the House of Delegates or the Board of Directors.

ARTICLE X.

Fiscal Year

The fiscal year shall be from July 1 to June 30.

ARTICLE XI.

Quorum

A quorum shall be in the House of Delegates a majority of Delegates, alternates, or appointees in good standing present at the annual convention; in the Board of Directors either the President or President-Elect and five other members; in the Advisory Council or any Committee, a majority of members serving on said Council or Committee.

ARTICLE XII.

Meeting—Order of Business

Section 1. The House of Delegates shall, unless some emergency in the opinion of the Board of Directors make it impossible or not advisable, meet annually at a time and place selected by the preceding meeting of the House of Delegates, but in the absence of such designation or if it be necessary in the opinion of the Board of Directors to change the meeting place, the time and place shall be fixed by the Board of Directors and announced by publication in THE AMERICAN JOURNAL OF MEDICAL TECHNOLOGY.

Section 2. The Advisory Council shall meet in connection with each annual convention at such time as shall be designated in the convention program, and at such other times and places as may be determined by the Board of Directors.

Section 3. The Order of Business at the annual meeting shall be as follows:

1. Call to Order.
2. Roll Call.
3. Reading of Minutes.
4. Report of Executive Secretary.
5. Report of Treasurer.
6. Report of Board of Directors.
7. Report of Advisory Council.
8. Report of Standing and Special Committees.
9. Unfinished Business.
10. New Business.
11. Communications.
12. Report of Election.
13. Induction of New Officers.
14. Resolutions and Adjournment.

Section 4. Parliamentary authority for all meetings of this Association shall be in accord with "Robert's Rules of Order, Revised"

except where otherwise specified in these By-Laws.

The scientific papers and all scientific discussions at the Association's convention program shall be limited in number and length by the Program Committee. All papers read by members or submitted to the Association shall become the property of the Association and shall be published, if warranted, in THE AMERICAN JOURNAL OF MEDICAL TECHNOLOGY under the copyright of the Association unless a petition for the privilege of prior publication has been obtained of the Board of Directors.

Section 5. A competent and fully qualified attorney at law to be selected by the Board of Directors, may be retained by this Association to serve as its legal counsellor.

ARTICLE XIII.

Official Organ

Section 1. The official organ shall be THE AMERICAN JOURNAL OF MEDICAL TECHNOLOGY which name shall be **patented**, and the contents of said organ be **copyrighted**.

Section 2. The Journal shall be made available to all members, not in arrears of dues.

Section 3. The Editor shall be elected by the Board of Directors and shall serve during the pleasure of the Board.

Section 4. The Editorial Board shall consist of the Editor, two Associate Editors, and two Advisory Editors. The associate and advisory editors shall be selected and appointed by the Editor with the approval of the Board of Directors.